AVIATION

The Oldest American Aeronautical Magazine

FEBRUARY 2, 1929 Issued Weekly PRICE 20 CENTS

Flight picture of the new Model A-429 American Eagle folding wing sport biplane

VOLUME XXVI

NUMBER 5

Special Features

Light Plane Records

The Kreutzer "Air Coach"

Operation of an Aviation Weather Bureau

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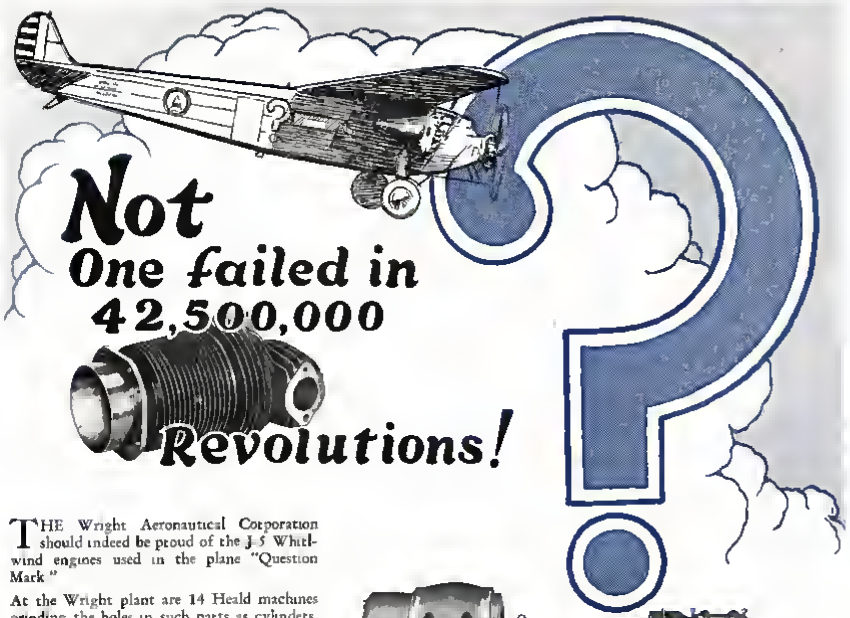

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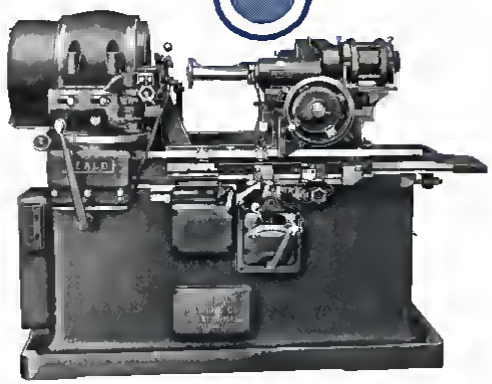

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. . . BECAUSE OF A VERY UNUSUAL ANNOUNCEMENT BY.

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World's Endurance Record for Women Pilots is Broken by the Golden Eagle

THERE is a very definite reason why the world's endurance record for women was officially broken on January 2nd by Miss Evelyn "Bobbie" Trout in a GOLDEN EAGLE monoplane.

It is so obvious fact, without any possibility of contradiction, that if the GOLDEN EAGLE did not fly hands-off on women weighing but a 110 pounds could have possibly held the ship in the air on a continuous flight for twelve hours and eleven minutes. This feat is bound to convince even the most skeptical that it is possible to build a small sturdy, sweet-flying airplane.

It is impossible to detract from the glory of Miss Trout's wonderful feat. She is a nervy, lovable, game little girl, who has won a place in the heart of all aviation enthusiasts. But she herself says that most of the time the ship was flying hands off. This feat was accomplished in one of the first production GOLDEN EAGLES, with a wing that has only four and one half foot chord.

Consider what a wonderful airplane it will be when the following changes are made: 5½ ft. chord wing instead of 4½ ft., the wire cable being removed from the ship by the use of retreat-line cables; the tail surface increased to 28 sq. ft., which is about 18% of the effective wing area, rear cockpit moved forward 8 inches permitting the engine mount to be shortened 8 inches, thereby eliminating practically all engine vibration, split axle type landing gear set 4½ inches higher so as to increase the landing angle to point of efficiency where the GOLDEN EAGLE can positively be guaranteed to land at under 30 miles per hour even under the hands of a student pilot. Aluminum tanks are now being used, built to the curve of the wing, mounted from top, and uncovered, thus facilitating easy removal in case of leakage. This tank has a 27½ gallon capacity. The cowl tank has been thereby eliminated, which in turn permits the installation of dual instrument boards. The wing of the GOLDEN EAGLE is now constructed with a 30 ft. 6 in. span, 5 ft. 6 in. chord. Ailerons are counter steel tube control.

This one message can be conveyed without any possibility of accusation of misrepresentation: "There is no commercial airplane built or offered for sale that is better looking, more desirable, more steady to flight, or safer for students than the GOLDEN EAGLE monoplane."

Prices are as follows:

Ship without engine $1800.00

A liberal discount is allowed to dealers and distributors. The Velie engine is offered at $950.00 net with propeller, or the LeBlond at $990.00 net with propeller. Engines are not subject to any dealer's or distributor's discounts. These prices are f.o.b. flyaway Inglewood. Dealers and distributors will be furnished with photographs as well as descriptive circulars.

For quick delivery send draft with order for 10 per cent of purchase price. On receipt of same you will be advised of the approximate date of delivery. Prompt reply is necessary for early delivery or for exclusive sales territory.

R. O. BONE CO.
415 East Industrial Avenue
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Surely the most skeptical are now convinced that it is possible to build a small airplane that is not too hot. Does any one now believe that the GOLDEN EAGLE is not a sturdy, easily managed, perfect performing airplane?

R. O. Bone

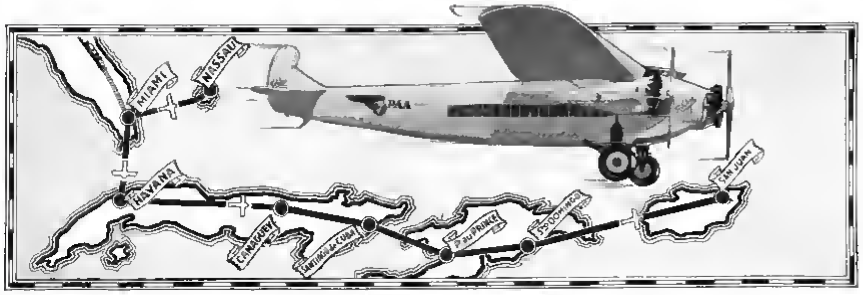
Message to Dealers

Territory open—liberal factory cooperation—investigation urged

GOLDEN EAGLE

NOW EVERYBODY CAN AFFORD A PLANE

AVIATION February 2, 1929



Pan American Achievement

AFTER fifteen months of successful passenger-mail service from Florida to Havana, Pan American Airways, Inc., has inaugurated through rail air service from the East and Middle West to the Indies.

It now takes another important step in developing international air transport by retaining Colonel Charles A. Lindbergh as technical adviser to Pan American Airways, Inc., and its affiliated operating companies, and also as consultant to Aviation Corporation of the Americas, the holding company.

Colonel Lindbergh will pass on all matters pertaining to routes, airports, equipment, and all technical matters relating to Pan American service.

Speed With Safety

This action follows the Pan American policy of making safety of operation its first consideration. It has procured the most able technical advice, just as it has equipped its giant tri-motored Airliners with directional radio giving constant communication with two airports, furnished them with every safety device known to modern aviation, manned each with two veteran pilots and a capable steward. To qualify, senior pilots must have 2000 hours of flying time, junior pilots, 1000 hours.

While placing safety foremost, Pan American Airways, Inc., has had due regard for the modern requirement of speed. From the northern terminal at Miami, Airliners daily make the voyage to Havana in 2 hours and 15 minutes, saving an entire business day. Thrice weekly service from Havana to Port au Prince, Santo Domingo City, and San Juan clips 33½ hours from the former travel time. Thrice weekly service from Miami to Nassau covers in 2 hours the distance requiring sixteen hours by steamer.

Nor has passenger comfort been forgotten, as is shown by our operating agreement with seven great railroad systems. Through rail-air service to the Bahamas and all parts of the Indies has been inaugurated. The entire Atlantic seaboard and the great cities of the middle West are now offered for the first time a fast, unbroken-luxury journey to Havana and all parts of the West Indies.

Combined Rail-Air Service

Six of the nation's finest trains daily carry passengers to Miami. Private motor cars convey arrivals to Pan American Airport, the first Rail-Air Terminal in America. Gigantic tri-motored Airliners wait to speed them on their way. Within one hour after arriving in Miami they are moving with speed and comfort toward the tropical islands.

Pan American Airliners present a revelation in travel comfort. Restful easy chairs, flanking a wide central aisle, offer a view through full vision windows. Mail and baggage have their separate compartment. Modern toilet facilities provide for passenger comfort. In short, the Airliners continue the luxurious service found on these excellent connecting trains.

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Information, rates and reservations are available at 800 principal railway offices or at any office of Pan American Airways, Inc.

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122 E. 42nd Street, New York City

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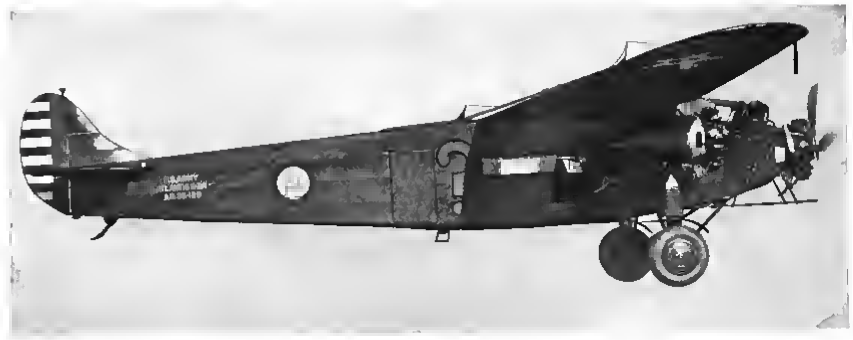

150 hrs 40 min 15 sec

SIX and a quarter days of sustained flight! Surely, this is the supreme test! The world of aviation is discussing the Fokker Trimotor, *Question Mark*, as the greatest mechanical marvel ever made by man.

An argosy of the air with thousands of working parts, and every part passed this 150 hour test, untouched by human hands! The installations of power plant accessories, for example, involve a multitude of necessary details—oil pipes, fuel lines, electrical wiring, engine controls and mountings—any one detail of these can make or mar a flight.

Starboard engine installation of Fokker C-2 Trimotor

The wonder is that, thanks to the makers' experience and engineering skill, such a mass of intricate construction has been wrought into one unit so complete and so dependable.

Let any aircraft operator ask himself what plane other than a Fokker could have achieved such a demonstration of reliability. Again the construction, inherent stability, and fatigueless controls of the Fokker are confirmed by a record for endurance. Once more the many Fokker features, developed and refined during 18 years of airplane production, are established on a still higher level by this most remarkable flight in all aviation history.

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SELECTING a school of aviation should not be difficult, for today the insistent demand is for BETTER pilots who have had the BEST training.

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No longer does the choice of a training course depend on flash in advertising, imposing displays of airplanes, indefinite promises or "new methods". The student pilot of today wants to KNOW that he is getting quality.

The Spartan School of Aeronautics is organized and operates by that standard.

No other school uses as many expensive biplanes exclusively for training.

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The million dollar Spartan Aircraft Company factory is their technical classroom.

Climatic conditions at Tulsa offer flying weather with virtually no interruptions.

The Spartan tuition charge is recognized as standard—and the charge for solo flying is 40 per cent less than the charge for dual control instruction.

There is only one "method" for teaching men to fly. That method is flight. The rest depends upon the ability and personality of instructors, use of modern equipment powered with modern motors and the advantage of a great airport and its attractions to national air travel.

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TRAINING THAT PRODUCES NATURAL PILOTS,
and write for your copy.

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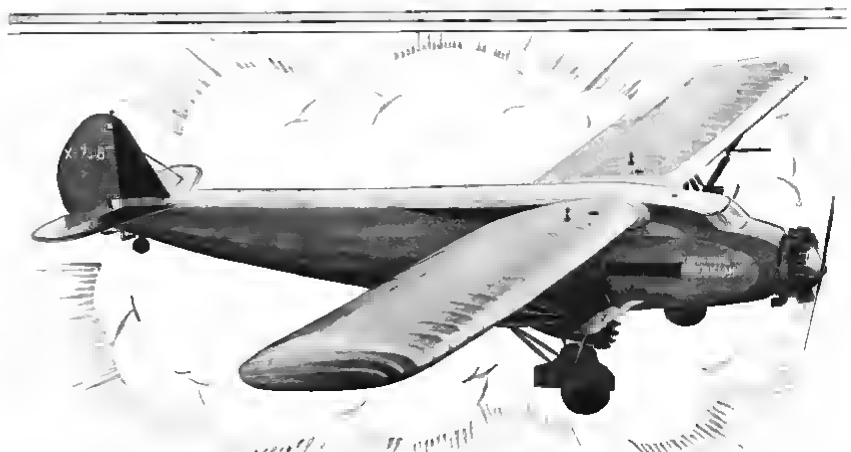
KEYSTONE

"THE KEYSTONE OF SAFE FLYING"



PATRICIAN
20 passenger transport

A nation-wide tour by the Patrician

KEYSTONE'S 20-passenger Transcontinental Air Liner leaves Bristol, Pa., in early February on a Demonstration Tour which will include the principal cities of the United States. Aviation enthusiasts and operators will be given an opportunity to see—yes, and to fly—*the safest, swiftest, largest transport ever produced.* The following are actual performance figures,—

151 miles per hour . . 17,400 ft. ceiling . . 3880 lbs payload
—unmatched in the multi-engined field.

A production series of planes of the Patrician type is now well under way and the summer of 1929 will find them in daily service on several leading air lines.

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Plants
Bristol, Pa., and New York City

Manufacturers of the KEYSTONE-LOENING AMPHIBIAN

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The VOUGHT ORGANIZATION

the BACKGROUND *of*

The "CORSAIR"

A VOUGHT ASSEMBLY LINE

Chance Vought Airplanes embody the most modern production methods, the most painstaking accuracy and the most advanced engineering.

THE CHANCE VOUGHT ORGANIZATION indeed has an enviable record and a remarkable background.

Mr Chance Vought, the head of the organization, is one of the country's pioneer pilots, having learned to fly in 1910, and since that time has devoted his entire efforts to the aircraft industry, designing and building a long series of outstanding and advanced types of aircraft.

And practically all the executives and many others in the Vought Organization are seasoned pilots and engineers who know flying as an everyday job, and consider their work both as a business and pleasure.

In twelve years Vought planes have progressed from the VE-7—which easily won the Army wartime training plane competition—to the latest "Corsair," which has officially shown itself to be the finest plane of its type in the world, and which has established Four World Records for speed and altitude.

Small wonder then, that Vought planes, with their background of high-performance and reliability in the most difficult missions, have become a favorite with those who fly, and were flown over 3,500,000 miles in our Naval Air Service in 1928, to establish a new operating record.

In military, commercial or private service—over land or water—no task is too difficult for the "Corsair"

CHANCE VOUGHT CORPORATION

Aeroplanes VOUGHT

LONG ISLAND CITY - - - - NEW YORK

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Good Landing Conditions with Chromilite Landing Field Floodlights at Roscoraue Field, St. Joseph, Mo.

Westinghouse Chromilite Landing Field Floodlight at Roscoraue Field, St. Joseph, Mo.

Westinghouse Puts Confidence at the Controls

When the pilot knows that the light spread on the field below him comes from Westinghouse Chromilite Landing Field Floodlights he knows that every precaution has been taken for his safety. Watch the assurance and ease he displays as he lands.

He knows he can land directly into the light, if he must—glare is reduced to a minimum. He knows that irregularities in the field are lighted. There are no shadows to confuse him. He lands confidently, knowing that the light on which he depends comes not from one source, but from several. Failure in one projector at the moment of leveling off cannot place him in jeopardy. The other units provide ample illumination for a safe landing.

If you have an airport lighting problem it will be to your advantage to discuss it with a Westinghouse representative. Let him show you how Westinghouse Chromilite Landing Field Floodlights have been designed to provide safe, flexible and economic illumination. Westinghouse Airport Lighting Equipment is described in the Westinghouse Airport and Floodlighting Catalog 288-C. Write for a copy.

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Commercial Lighting Section
MERCHANDISING DEPARTMENT SOUTH BEND, IND.

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The Oldest American Aeronautical Magazine

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AVIATION

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Aircraft Production

ACCURATE and detailed figures, published at the beginning of each new year as to the number of airplanes built during the preceding year would certainly be of immense value to all concerned. It would mean that manufacturers would really know their own relative position and would be able to estimate their future production much more accurately. It would also protect them from the exaggerated claims made by many of the newer manufacturers. It would supply figures on which manufacturers of accessories and raw materials could base future demands, and it would give the public and investors a much better picture of what the aviation industry was doing.

At present it is impossible to obtain and publish at an early date, accurate figures on aircraft production. Questionnaires have been sent out by many agencies requesting information on production during 1928 but many of the manufacturers have not responded and there is no check of the accuracy of the questionaires which have been answered. Therefore one can only count on "round numbers." The figures should give the number of planes of different types and classes actually built and also the number of those sold.

In answering a questionnaire a manufacturer will often put in his estimated production for the next year instead of his actual production during the past year. This is but a slight clerical slip but it makes a lot of difference. Knowing that the figures of others are apt to be unreliable and not wishing to appear behind the procession, many of the more reputable manufacturers will either refuse to give their production figures or will not allow them to be published. As a matter of fact, for a manufacturer to decline to reveal production information, for fear that the exaggerated figures will "show him up" is rather a ridiculous attitude to take. At this stage of development in the industry, production is not the only item by which a manufacturer may be judged. There is much work to be accomplished in other departments of the business, and it is altogether possible that a low production figure may mean that a majority of effort has been devoted elsewhere temporarily.

In other industries the publication of production figures is very prevalent, and most of the manufacturers in the aircraft industry would probably be more than willing to issue figures provided they felt that the other manufacturers were also putting out honest information. The Census Bureau will ultimately provide figures which are quite accurate but in an industry which is changing swiftly these figures take too long to compile. Through its system of licensing and inspectors, the Department of Commerce could easily gather production figures, but their prompt publication would require the cooperation of the manufacturers. In the long run, honest statements about production will be as valuable as honest statements about performance, and it is hoped that manufacturers will come to see the need of debunking production figures.

Water Flying Clubs

THE progress of the flying club movement in this country is rapidly reaching a point where it will form a most valuable market for airplane and engine manufacturers. Almost every day, there is news of the formation of a new flying club, and, very recently, the establishment of the first units of a nation-wide chain of active clubs was announced. Such activity is most gratifying, but, strange as it may seem, all of the clubs are using land planes. The seaplane and flying boat have not as yet appeared upon the scene and there is no reason why development in this direction would not be most beneficial to all concerned.

As a matter of fact, the formation of a water flying club would incur less expense and effort than the formation of a land flying club, for the reason that "ground facilities" are already provided. There are over 500 yacht clubs in the United States, many of which are of sufficient size to inaugurate and maintain aviation divisions. These clubs are established and they have just the type of member that the flying club movements are attempting to enroll. They have clubhouses with locker rooms, showers, dining rooms and sleeping quarters, and they conduct social activities throughout the year.

Gasoline and oil are available at all yacht clubs that have power boats and auxiliary cruisers in their fleets. Many of them have power tenders for the purpose of taking the members and their guests from the clubhouse to their boats. These could be utilized for the purpose of taking a member to his seaplane. In addition, the crew of the tender could cast-off the mooring line, and then could tow the plane into open water, where the engine might be started and the take-off made. The tender, of course, would "stand by" until the engine was started. Besides this, most yacht clubs have cranes or marine railways, which are used for hauling out the yachts at the end of the season. They could be used equally well for planes if any repair work was necessary.

Those, who have flown both types, know that the seaplane provides as much, or more, in the way of thrills as the land plane. The yachtsman likes the water, and therefore the seaplane or flying boat should have a very definite appeal. In addition, water planes could be quite useful in carrying members of a regatta committee to distant points and in supervising the racing of surface craft.

The club would probably not consider the purchase of machines for the use of its members any more than it would consider the purchase of a yacht for the same purpose. However, there would be nothing to prevent several of the members, who individually could not afford to own and operate a seaplane or flying boat, from owning one collectively. In the final analysis, it would seem that water flying as a sport is something that could and should be developed. Popularizing this branch of aviation with the yachting fraternity will not only do much for the advancement of amateur flying, but will also offer an additional market for the sale of seaplanes and boats.

Airplane Operation Above Latitude 60° North

By Capt Charles Sutton
Chief Pilot, Dominion Explorers, Ltd

OPERATING planes over the Northwest Territories of Canada, which lie above latitude 60 deg north and between Hudson's Bay and the Yukon, present many difficulties, not encountered by the aircraft operator in the more temperate zones. Yet, the solution to the problems evolved by the operators in the north may offer suggestions for surmounting the lesser difficulties with which the ordinary commercial operator must contend.

Dominion Explorers, Ltd., is a Canadian mining firm of the Thayer Lindsley group. It was organized early in 1928 for the purpose of making a complete survey of the mining possibilities in the northwest and to stake claims, to be mined later, if any deposits of sufficient size are discovered. In other words, the company was organized for the purpose of prospecting for gold, and it is using "Whirlwind" powered, Fairchild cabin monoplanes to carry on its gold prospecting activities in the lands above latitude 60° north.

A rear quarter view of one of Dominion Explorers' Fairchild monoplanes on floats, while hauled out of the water for the purpose of making minor repairs and adjustments

In spite of the increased cost of operation, the plane is saving an enormous amount of money, as well as time and labor, in determining the locations of mineral deposits in the Northwest Territories. One plane, carrying a geologist as an observer, can perform the work of 100 old time prospectors traveling the lakes and rivers in canoes. Moreover, through the use of the plane, it is possible to cover the country much more thoroughly.

The method employed by Dominion Explorers is to have one of its geologists fly over a certain area. The geologist marks on his map those places where there appears to be a likelihood of finding gold, and scratches others where there is no indication of mineral deposits. In this connection, it has been learned that deposits are often found just a few hundred yards to one side or the other of many of the lakes and streams, but just out of sight and, for all practical purposes out of reach of the prospector following the shoreline.

After finding and marking the position on his map of a place that appears to offer possibilities for mining, the geologist and the seaplane return to the base. A rigid canoe carried under the fuselage, supplies, a diamond drill, and other articles necessary for a thorough examination of the place are loaded into the seaplane, which takes these materials and two mining engineers back to the nearest body of water to it. The engineers remain there for from two to three days, and if the examination warrants it, a claim is staked. At the end of the time, the plane returns to take them to their next destination.

The worth to Canada of the Northwest Territories lies only in the mineral wealth which may be found there. For any purpose other than mining, the country is valueless. It is flat and save for the many boulders left by the passage of the great glacier, it is quite barren. It is reported that there is a colossal amount of wealth there in minerals, but whether or not the deposits are large enough to warrant the institution of mining operations on a large scale, and whether or not they are of sufficient size to compensate for that and the cost of bringing the ore back to civilization, it has not been determined. Within the next five years, however, the future of the northwest should be known.

A view of the moveable huts, which were equipped with stoves and designed to keep the engines of the planes warm.

The two "Whirlwind" powered Fairchild cabin monoplanes of Dominion Explorers, Ltd., with other planes on the ice at the Pas, where they remained until ice conditions permitted the continuation of the flight to Winnipeg

Our operations began when we started the flight north from Amityville, L. I., N. Y., with our two "Whirlwind" powered Fairchild FC-2 cabin monoplanes. That was July 8, 1928. The planes were equipped with twin seaplane floats because over one-half of the Northwest Territories are occupied by rivers and lakes, and the seaplane is the only logical type for use there.

On the way up we landed at Montreal, Ottawa, Trout Mills, Lake Nipigon, Minaki, Lake Winnipeg, Thicket, which is on the Hudson's Bay railroad, and at Churchhill, Canada's new grain port on the Bay itself. From Churchhill we flew to Tavane Bay, which is located just above the mouth of the Ferguson River and in latitude 62°04' north.

Trip Made in 35 Hr. Flying Time

The planes completed the flight, a distance of 1,985 mi. in 35 hr. actual flying time, although it was not until August 8 that we arrived "there in the north," which is the meaning of Tavane in eskimo. Our three-master schooner, the "Morso," in command of Captain Randall, arrived at Tavane Bay approximately at the same time we did. She had come up around the coast of Labrador, and carried a cargo consisting of 8,000 gal. of gasoline in drums, 100 tons of coal, and tents, building materials, spares for the planes, and machine shop equipment. With these materials, the work of building our base was started immediately. The long wave and the short wave radio sending and receiving sets brought up on the ship also were placed in operation as this was our only means of communication with the outside world.

On August 13, the planes flew back to Clearwater Lake, Manitoba, to pick up the remaining prospectors of our party. The journey to Clearwater was uneventful, except for the fact that I made a forced landing on a small lake between there and Churchill as the result of a seized rocker arm. The lake, by the way, was named then and there, "Dud Rocker Lake." It is interesting to note in this connection that before making the landing, the compass read north 25 deg. After effecting repairs, I took off and climbed to an altitude of 3,000 ft., only to find that on returning to the original course, the compass showed south 186 deg. It remained at this reading until we had flown at least 10 mi. and then returned to north 30 deg., even though the course of the plane was not altered in the least.

When finally assembled at the Tavane Bay base, the party of Dominion Explorers, exclusive of the ship's company, were Capt. B. W. Broatch and W. A. Spence, two other pilots for the firm, John C. Rogers, chief geologist and one of the best mining experts in Canada, "Sandy" Reading, another geologist, five mining engineers, a cook, and a professional radio operator, besides myself. "Jeff," the thoroughbred airdale belonging to Mr. Reading, was the mascot.

Upon the return of the planes to the base, August 22, the work of establishing food and gasoline caches and of carrying prospectors and freight over the country, preceded by Mr. Rogers, was entered into in earnest. On September 3, the Fairchild G-CARI, which I was piloting and with Mr. Rogers and Mr. Reading as passengers, took off for Baker Lake on our first cross-country flight made out of sight of the Hudson's Bay coastline. The distance was 195 mi.

The compasses of the planes had remained stationery at north 33 deg. longitude up until this time, and it was thought that there might be a variation further inland, but on the whole trip, no difference was noted. As a result, the course was set by the sun. Keeping a constant check on the speed, time, and, as far as possible, on the drift, we were able to chart our position by large lakes that appeared to resemble those shown on the map. Inasmuch as the map used was drawn to a scale of 32 mi. to the inch, very few lakes were shown, and many of these were later found to be as much as 10 mi. out of position, according to the map.

The entire flight was made against a wind with a velocity of about 25 m.p.h., but with this wind to combat and with a load of 860 lb., the lake was reached in 3 hr. and 50 min. During our stay at Baker Lake, the only trouble we experienced was with one of the pontoons which was punctured. The plane was tied up on the beach and because of the heavy sea, pounded so excessively that a small, sharp stone finally cut its way

through the bottom. Repairs were effected with great difficulty, inasmuch as there were no facilities for beaching the craft. What is more, it must be realized that it was a rather cold job since the temperature of the water was about 34 deg. F.

The strength of the winds on Baker and other inland lakes is much stronger than that encountered on Hudson's Bay, it was found. On the coast, except during the equinoxial gales when the wind averaged from 40 to 50 m. p. h., the normal wind velocity is from 20 to 30 m. p. h. On the inland lakes, however, the winds average from 30 to 35 m. p. h., and are accompanied by heavy seas, which make landing and taking-off in a seaplane extremely difficult. In one instance, it took exactly 40 min. to take-off from Lake Komut which is to the north of Baker Lake. The seas were so great that the spray continually went over the top of the plane, causing a short circuiting of the spark plugs in the Whirlwind engine, and covering the windshield with water.

From September 18 to September 24, the equinoxial gales were in full force, reaching a height at one time of 80 m.p.h. My plane, with myself as pilot was caught in them at Rankin Inlet with a large party of prospectors. The plane was anchored in a sheltered bay with two anchors totaling 110 lb., but on the second day, the anchor lines carried away and the plane piled up on the rocky shore. Fortunately, two of our party saw what had happened when they were some two miles away, and fired two shots with their rifles, which is our distress signal. This brought the remainder of the party out of the tents in which we were living.

Few More Dents Only Damage

We reached the plane before any more damage was done other than adding a few more dents to the pontoons. I started the engine and taxied the plane away from the beach, making it fast in another place. Those used to handling seaplanes will realize that this was an extremely difficult job in winds of gale proportions. When the plane was secured once more, a canoe set out from the beach to take us back to shore. We climbed in, but the seas were so high that it was an impossibility to turn the canoe about without very great danger of swamping it. As a result, we were carried two miles down the shore before we could reach land.

The Fairchild G-CARH, piloted by Capt. Broatch, proceeded to Chesterfield Inlet on September 29 for the purpose of obtaining skins for our winter clothing. The normal tide in the north has a rise of about 10 ft. However, on October 4, the tide rose to 25 ft. and was accompanied by high winds and heavy seas. This caused the plane to break away from her moorings in the inlet, and the next morning it was found high and dry on the only strip of beach along the rocky coast. Fortunately, kelp abounds at Chesterfield and by laying down a path of it from the machine to the water's edge, a distance of some 200 yd. Captain Broatch was able to run the plane into the water again at the next high tide.

Other Fairchild Thrown on Rocks

At the base, we had a very similar experience with the tide. The other Fairchild broke away from her moorings and was thrown up on a pile of rocks, which badly damaged the floats. In addition, the sea reached our supplies and we found 30 full gasoline drums, canoes, building materials, oil drums, crates containing spares for the planes and a number of other articles floating about. The extremely high tides, which we were informed had never before been experienced, last three days. At the end of that time, the wind shifted from east to northwest and the water fell back to its normal level. I might add that the prevailing winds are from the northwest. It is rarely that there is an east wind, but when it comes, it brings a thick blanket of fog making any operations with the planes utterly impossible.

We had intended to return to Winnipeg, our winter overhaul base, with the planes still on floats. On October 13, it was warm enough up where we were located on the Bay to walk about without heavy outer clothing. I had taken off with one of the Fairchilds and was circling about waiting for the other machine before starting out for Winnipeg. After flying around for some 20 min., I landed to find out what the difficulty was with the other plane. It had been unable to take off, because of a lack of "revs." This trouble was eradicated and both planes were about to take off when one of the party, which was

Changing the landing gear of one of Dominion Explorers' Fairchild cabin planes from floats to skis

The base of Dominion Explorers, Ltd., at Tavane Bay in latitude 62° 04' north

remaining in camp, hurriedly left shore in a canoe. He had a radio message from the head office, informing us that the lakes to the south of Churchill were frozen over.

Knowing that it would be extremely dangerous to proceed with the planes mounted on floats, we decided to wait for cold weather and to come "out" on skis. If the radio message had not arrived, both planes probably would have been seriously damaged in negotiating a landing at Deer Lake, which was covered with a thin layer of ice, and was scheduled as the first stop. The weather conditions in the north had been so favorable that we believed, naturally, that the lakes farther south would be open for at least another 10 days. In this case, the radio certainly proved its value.

The work of fitting the planes with skis was commenced October 15. We had had a good fall of snow, and two days later, they were moved up to a plateau behind the camp. The plateau was to serve as a flying field as soon as the snow was deep enough. It had become cold enough by this time so that some means for keeping the oil and the engines warm had to be provided. As a result, we constructed some huts, which measured 12 x 16 ft. These huts were constructed on skis and held down by ice anchors.

The huts were open on one side except for a heavy canvas wall. There was one hut for each plane and the nose was pushed inside. Each hut was heated with a large coal stove, so that a temperature of from 60 to 70 deg. F. was always maintained inside, even though it might be as cold as 45 deg. below zero outside. This allowed the mechanics to work on the engines in comfort, and it also kept the engines warm enough so that we experienced absolutely no difficulty in starting them, even in the most severe weather. Another feature was the portability of the huts. Since they were mounted on skis, it was always possible to anchor them with their backs toward the wind.

Open Cockpit Type Not Suitable

Two DeHavilland Moths, powered with Cirrus engines had been shipped up to us for use in our prospecting operations. These planes were assembled at the base and were used in some of the work. They performed very satisfactorily, but the open cockpit type is not particularly well suited for operating in the north. Even the cabin planes are cold enough in extreme weather. In regard to the Moths and the FC-2's however, it might be interesting to note that we developed a portable heater, operated by a blow torch, which warmed the engines of the planes within 20 min. so that the propeller might be turned almost with the little finger. This heater was used in winds of from 35 to 40 m. p. h. without the slightest difficulty.

On October 28, the Moths commenced flying on skis from the lake behind the camp, and on November 3, one of the Fairchilds took off from our field, even though there was barely an inch of snow on the ground. A couple of days later, the other Fairchild was tested on skis. Both of these cabin planes took off and landed on the bay, November 22, which at that time was found to have 14 in. of ice on it as far as three miles out. Full loads tests with 880 lb., excluding the pilot, were made and on November 24, both planes left for the Pas. The engine of G-CARH again "revved down," and the plane was forced to drop half of its load. However, G-CARI took off with 891 lb. Both planes reached the Pas November 28, where they remained until ice conditions at Winnipeg permitted the continuation of the flight.

The navigational difficulties encountered in the north are great, for as it has been pointed out, the compasses on the planes were useless, always pointing to north 33 deg. There are very few landmarks out of sight of the coast line. The country, for as far as the eye can see, is a mass of small lakes and rock. The lakes are quite similar, and since they are bordered by rocks and boulders, practically of the same color, it is a very difficult proposition to pick out points ahead as guides. Only the large and peculiarly shaped lakes may be used to mark the course. The rivers shown on the maps are badly charted and cannot be relied upon.

Difficulties of Operation Many

The difficulties to be met in finding safe anchorages for the planes and in landing prospectors are many. The whole coast line is dotted with boulders and submerged rocks, which are found jutting up to within a few inches of the surface, although the depth of the water may be as much as 30 ft., were responsible to a great degree for the damage done to the pontoons of both Fairchilds. In addition, the extremely high winds and the accompanying heavy seas on the Bay and the inland lakes makes landing and taking off with full loads rather difficult.

The ordinary type of seaplane float is not as satisfactory for operation in northern waters as it might be. Its shape is not all that could be desired. Moreover, when the bottom is punctured, the ordinary pontoon will take in very nearly 500 lb. of water in one compartment. I have suggested some modifications, which will be embodied in the floats manufactured for the use of Dominion Explorers in the north this year by the Metalboat Division of the Fairchild Airplane Mfg. Corp. In the new pontoons, the external appearance will not be altered but the internal structure will be changed.

The principle feature of the new floats will be a double bottom, so that in case of running against submerged rocks that may puncture the outer shell, the most water that can be taken in will be 17 lb. With these floats, we believe that we shall be able to operate all summer without having to effect repairs. The draft will not be increased at all, for with a full load, the planes draw enough water as it is. The handhole plates will be replaced with pipes reaching down into the watertight sections of the pontoons. These pipes will be covered with screw caps and the pontoons will be pumped dry by means of a bilge pump screwed to the pipe after removing the caps. The tops of the pontoons on our planes are constantly awash and we found that the ordinary type of handhole plate with a rubber gasket is inefficient.

Light Plane Records

Some Timely Remarks Regarding the Situation in This Country and the Prospect for Future Conquests

By James M. Robinson
Vice-President, Brooklyn (N. Y.) Light Plane Club

With the advent of an encouraging number of manufacturers into the American light aircraft field within the past six months, one may easily believe that many performance records are to fall by the wayside in the very near future.

World record flights involving airplanes are something we seldom hear about here in the United States, while in foreign countries they have developed the light plane and the light plane engine to a marked degree. This is proved by the fact that out of 10 light plane world records the United States holds but one. This record being won for the United States last February by the skillful piloting of the late Harry J. Brooks. Brooks, piloting a Ford monoplane with a 36 hp. engine, flew from Detroit, Mich., to Titusville, Fla., an airline distance of 972 mi. His plane was a single seater and came under the third category which limits a competing plane to a weight (empty) of from 200 to 350 kg. Expressed in pounds this would be approximately 440 to 770.

The first category for light aircraft, as adjudged by the F.A.I., places the craft as a two seater weighing less than 400 kg. or about 880 lb., the second category as a single seater weighing less than 200 kg. The weight empty is considered in all cases.

There are no records for altitude or for speed in the last named class, but a Hungarian gentleman by the name of Charles Kaszala has certainly put up a fine mark for everyone to shoot at as far as distance is concerned. This pilot, in a Lampich monoplane of only 18 hp. succeeded in flying a closed circuit distance of 403.9 mi. And that over a year ago. In June, 1928 Kaszala flew from Budapest to Pola with the same equipment, setting a world's record of 517.04 mi., airline distance. But that is not a hopeless record for an American plane to break, even though it is a good one. Upon looking over the light plane field here one will find that the material with which to accomplish this is not altogether lacking and stacks up well.

There is the Heath Parasol for instance, a single seater weighing but 290 lb. But still, its disposable load is 250 lb. With its 23 hp. Henderson engine it averages about 36 mi. to the gal. at a cruising speed of 65 m.p.h. Then there is the Irwin M-T-2, a 25 hp. plane which has a disposable load of 300 lb., a cruising speed of 75 m.p.h. and averages but 1.7 gal. of gasoline per hour at cruising speed. Theoretically this biplane could fly an airline distance of 750 mi. with a 150 lb. pilot. Actually it would be just too bad about Mr. Kaszala's record. Still another single seater under the dead line of 440 lb. weight is the 40 hp. Szekely powered monoplane manufactured by the Niles Aircraft Co.

In the two seater class there is more material from which to choose. Among the leaders are the Crown Motor Carriage Co.'s B-3, Kinner powered, with a high speed of 110 m.p.h. and a disposable load of 700 lb.; the Driggs Dart with its Anzani engine of 35 hp., with its low fuel consumption; the Mohawk Pinto which cruises at 87 m.p.h. with a 475 lb. disposable load; the Arrow Sport with its 60 hp. LeBlond cruises at 95 m.p.h. and which has a disposable load of 450 lb. This plane has the possibility of wresting the speed record from Germany in this class, which is 119.27 m.p.h.

Finally, coming back to the third category, and that one spoken of first, one finds the United States fairly outclassed in all but the distance for airline travel. The only light plane record we can claim being this particular one. Distance (closed circuit) is held by a Czecho-

Capt. H. S. Broad, piloting a DH "Tiger" Moth

Slovakian, who, piloting a 60 hp. Walter engined Avia, flew 1,553 mi. This occurred in June, 1928, and kept Commandand Vicherck flying over Prague for over 18 hr. Germany holds the altitude record with a height of 22,250 ft. Paul W. Baumer set the mark more than a year ago in a plane of his own design.

And the speed record for 100 km. for this type plane went to Capt. H. S. Broad of Great Britain most decisively at Stag Lane, Aug. 24, 1927. Captain Broad in a DH Tiger Moth flew along the course at the amazing speed of 186.47 m.p.h. A record rather hard to improve upon at present unless an engine of equal or greater horsepower be used in our light planes than that which made the record. Captain Broad's Tiger Moth used a DH 32 engine of 130 hp. and weighing approximately two pounds per horsepower. The Warner Scarab engine fitted in a light plane built along special lines might prove interesting to those intent upon Captain Broad's speed record. Distance records for light planes will eventually go to those built along the lines of a glider and soarer, not unlike the Aeromarine-Klemm. The utilization of air currents helps a great deal in distance flights.

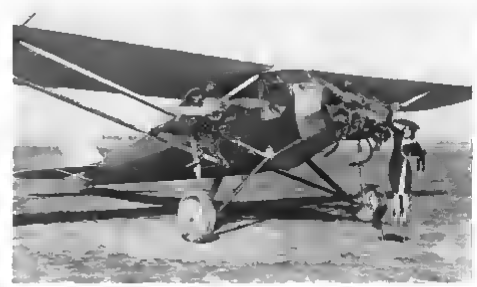
At all events with the efforts of those manufacturers and aeronautical engineers recently engaged upon light aircraft construction, it should not be many moons before the United States can boast of more than one in ten light plane world air records.

The Kreutzer Air Coach

Four Passenger, Braced Monoplane is Powered with Three Velie M-5 Engines and Has a High Speed of 110 M. P. H.

By Charles F. McReynolds

Excellent performance figures have been obtained for the Kreutzer "Air Coach" during preliminary test flights made by Lieut. Henry H. Ogden, at Mines Field, Los Angeles, Calif. The Air Coach, a four place, cabin monoplane powered with three Velie M5 aircraft engines, was constructed and test flown by the Aircraft Division of the Joseph Kreutzer Corp., within a period of 34 days after Albin K. Peterson, chief engineer, began to draw the design.



The first Kreutzer "Air Coach" being christened by Miss Raquel Torres, shortly before the test flights conducted by Lieut. Henry H. Ogden.

So carefully had the work been done that the Kreutzer plane demonstrated remarkable balance and stability during its test flights; control in the air and on the ground was satisfactory on any combination of engines and no design changes were found necessary. Good control and great reserve power were demonstrated when the Air Coach flew with full load on the nose engine alone, after throttling the two wing engines, without any appreciable loss of altitude for the complete length of Mines Field. Turns were made without loss of altitude while flying on two engines; while climbing tests showed an ability to climb off the ground at a steep angle for several hundred feet before leveling off. A maximum climb at sea level of 800 ft. per min. and climb to 10,000 ft. in 38 min. was accomplished.

Performance tests showed a take-off in still air in 5 sec., while landings were made at 36-38 m.p.h. Cruising speeds of 90 to 95 m.p.h. at 1,800 r.p.m. checked with predicted performance and a high speed of 110 m.p.h. was reached over a measured course with the engines turning 2,250 r.p.m.

Pilot and three passengers are accommodated in the cabin of the Kreutzer Air Coach, which is a monoplane of the high wing, braced type. Doors at the rear of the cabin on both sides of the fuselage with a wide step built integral with the body structure are provided.

With a wing span of 48 ft. 6 in. and chord of 7 ft. the wing has a total area of 315 sq. ft. Fuselage, tail surfaces and nacelles are of welded steel tube construction. Wing and ailerons are of conventional wood construction. Total length of the fuselage is 28 ft. 6 in., and height of the plane overall is 8 ft. 6 in. Total weight empty is 1,933 lb., useful load is 1,267 lb., and the total gross weight is 3,200 lb. The 90 gal. gasoline tank gives a cruising endurance of approximately 6 hr. and cruising range of 550-600 mi. The first "Air Coach" has a dark blue fuselage, nacelles and landing gear with cream colored wing, struts, and tail.

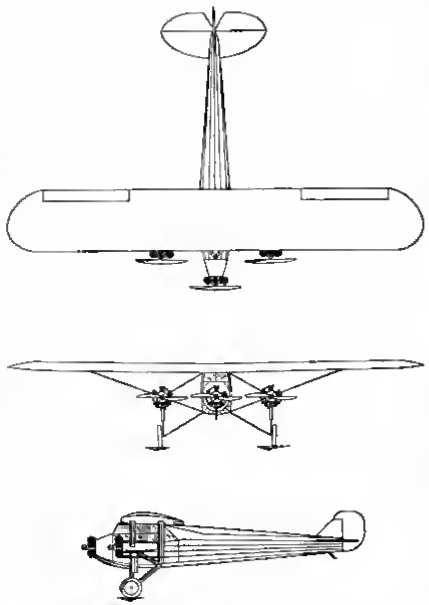
There are five bays of single wire drag bracing in each wing panel. Spars are of rugged box type with spruce caps and plywood sides. The Gottingen 398 airfoil is employed, ribs being of spruce and plywood truss.

A front view of the Kreutzer "Air Coach" showing the wide landing gear trend.

type spaced at 13 in across the wing. Additional false ribs are used along the leading edge with plywood covering top and bottom back to the rear edge of the front spar in order to keep a true curve. Small steel tubing is used to form the trailing edge of all surfaces, while the wing tips are formed of heavy welded steel tubing. Ailerons are of wood construction mounted along the upper edge to a false spar by means of eight wide piano type hinges.

The fuselage has an all welded structure nicely streamlined and oval in cross section. All tubing is treated inside with Lionoil, sealed and then painted outside with red oxide primer and one coat of gray. Fairing is accomplished with light dural tubing and both wing and fuselage are covered with grade A airplane fabric thoroughly doped. Inspection plates are provided where necessary at all fittings and controls in both wing and fuselage.

In mounting the wing to fuselage no center section is used, the two wing panels butting together above the center of the cabin and being firmly secured there and at the upper fuselage longeron on each side. Struts extend outward to the nacelle on each side from both upper and lower longeron fittings and from the nacelle fittings to from and rear wing spars. Landing gear shock struts also extend up to the from strut fitting on each nacelle from which point lateral landing strains are carried by a short diagonal strut extending down to the rear strut fitting on the lower fuselage longeron. This mounting gives a sturdy and efficient bracing for flight and ground handling.



Plan, elevation, and profile drawings of the Kreutzer "Air Coach"

The passenger cabin is of ample size, the four persons sitting in comfortable upholstered wicker chairs, two front and two rear. Floor is of plywood with walls and ceiling covered with tapestry. Triplex windows are provided around pilot's cockpit and double thickness plate glass extends entirely around the remainder of the cabin giving unusually good visibility in practically every direction. A large door of sedan type is provided at the rear of the cabin on each side of the fuselage. Dome lights are installed for night flying, and a large baggage compartment in rear of the cabin gives ample space for luggage.

Dual controls of Deperdussin type are standard equipment, the pilot and student sitting side by side in the two forward seats. Deperdussin and pedal type controls are used with cables running over micarta pulleys to horns on all control surfaces. A large instrument board extends the width of the cabin in front of the pilots with all engine instruments grouped on the left and flying instruments on the right. The three throttle levers are grouped at the lower center of the board. Stabilizer adjustment is mounted normally at the left of the left front seat.

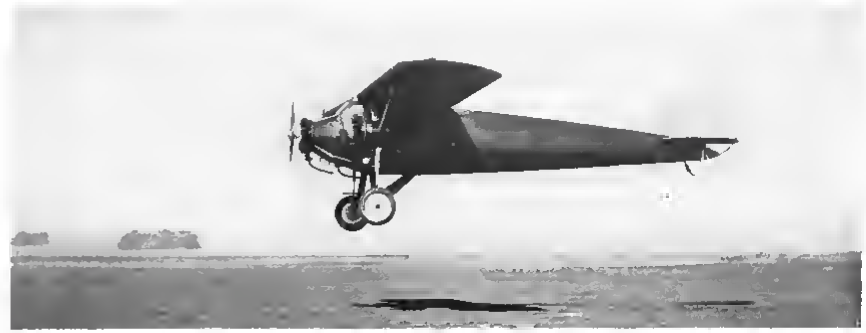
The three Velie engines are carried on detachable steel tube mounts. Exhaust collector rings are provided and exhaust gases are deflected from the cabin. Engines are all neatly cowled from the crank case back, cylinders being exposed for cooling. All controls and instruments are carried to the instrument board in the cabin. A heavy aluminum fire wall is installed between the cabin and the nose engine. Oil tanks are mounted in rear of each engine but the single 90 gal gasoline tank is carried above the cabin half in the butt end of each wing, and fuel is carried to the outboard engines by copper tube lines placed along the nacelle brace strut.

All tail surfaces are of steel tube construction. The horizontal stabilizer, having an area of 20 sq ft, is adjustable in flight. Elevators have a total area of 15 sq ft while the balanced rudder has an area of 12 sq ft. Due to the long fuselage a small fin is used, having an area of but 3 sq ft.

The landing gear has a tread of 13 ft 6 in which with the individual wheel brakes makes it extremely easy to taxi the plane. Tires are 32 by 6 in., and hydraulic shock struts are used, the result being a remarkably smooth take-off or landing on almost any sort of field. The tail skid on the first model is of conventional steel tube and rubber cord shock absorber type, pivoted for easy ground maneuvering, but all production planes are to be fitted with a tail wheel.

This airplane is thought to be the first small design of the popular three engine transport planes that have been built anywhere. Although Joseph Kreutzer is prepared to enter the market with other types of planes he feels that the "Air Coach" fills an immediate need and is pushing production on this model in order to carry through his program for popularizing this type of transportation with business executives. Selling at a very moderate price the Air Coach brings the utter safety of the three engined principle to the executive who finds it necessary to employ the fast transportation which only an airplane affords. With this dependability at low price there has been no sacrifice of performance or comfort and it is felt that the demand will far exceed the quantity production program now being inaugurated.

The first Air Coach was turned out in a temporary factory on the second floor of one of the Kreutzer Corp automotive buildings within 34 days after the plans were started. Many experienced workmen are in the Krentzer organization under the direction of Edward Donahue, superintendent of construction, and it is hoped to build at least two planes a month in the present quarters while a factory is being erected on the site of the new Kreutzer airport west of Los Angeles.



A flight picture of the Kreutzer "Air Coach" coming in for a landing after one of the tests conducted at Mines Field, Los Angeles, Calif.

According to the announcement of Joseph Kreutzer president of the Joseph Kreutzer Corp, activities of his company will soon include the operation of an up-to-date civilian flying school; operation of a service station for aircraft at the new Krentzer airport; and development of an aircraft manufacturing center.

In addition to the aircraft division, Mr Krentzer will continue to operate his Buick service, which has been for several years one of the largest exclusive Buick service plants.

Officials of the Joseph Kreutzer Corp., Aircraft Division are: Joseph Kreutzer, president and general manager; Albin K. Peterson, chief engineer; Lieut Henry H. Ogden, chief pilot; Edward Donahue, superintendent of construction; A. F. White, and Wendell Shore.

Specifications as supplied by the manufactnrer are as follows:

Length overall	28 ft 6 in
Height overall	8 ft 6 in
Airfoil	Gottingen 398
Span	48 ft 6 in
Chord	7 ft
Total wing area	320 sq ft
Stabilizer area	20 sq ft
Elevator area	15 sq ft
Fin area	3 sq ft
Rudder area	12 sq ft
Sweepback	None
Angle of incidence	None
Dihedral angle	1 deg
Weight empty	1933 lb
Pay load	600 lb
Disposable load	1267 lb
Gross weight loaded	3200 lb
Power plant	Three Velie M5's
Total available hp	180 at 2250 r.p.m.
Wing loading	9.5 lb per sq ft.
Power loading	17.7 lb per hp
Load factors	6.1 high incidence 4.0 low incidence 2.5 inverted flight 6.3 landing
Propellers	Wood-Story Prop Co.
High speed	110 m.p.h. at 2250 r.p.m.
Cruising speed	90-95 m.p.h. at 1800 r.p.m.
Landing speed	36-38 m.p.h.
Take off	5-8 sec
Climb at sea level	800 ft. per min.
Climb to 10,000 ft	38 min.
Service ceiling	12,500 ft
Absolute ceiling	15,500 ft
Gasoline capacity	90 gal.
Oil capacity	9 gal.
Range at cruising speed	550-600 mi.
Endurance at cruising speed	6 hr

A rear quarter view of the Kreutzer "Air Coach," showing the method of mounting the outboard engines

Operation *of an* Aviation Weather Bureau

By Horace R Byers
Assistant in Charge, Guggenheim Experimental Meteorological Service

WHAT is the ceiling over the Sierra Nevada? Can I get into the San Francisco Bay region? Is there ground fog in the San Joaquin Valley? Will there by any tomorrow? At what altitude should I fly to get tail winds? These questions, and many others, are the kind that someone has to answer for pilots flying mail and passengers on airways throughout the country.

They were not asked 15 yr ago. In those days, farmers and ship captains were practically the only ones interested in the weather. The problems now confronting airmen were of little concern to them. The United States Weather Bureau served them, and is still serving them in an admirable way. But when commercial airlines were started, and aeronautics came to the fore, it was up to the Weather Bureau to branch out into a new field where weather is a more important factor than it has ever been before in any line of human activity.

The government has put forth strenuous efforts to keep up with the rapid developments; and the questions asked by pilots are now being answered in many air centers in the country by competent meteorologists. Weather Bureau stations have been set up at all of the principal airways focal points and observers along the airways between stations keep a close watch of weather conditions.

Unquestionably the greatest development in weather service for aviators is the Weather Bureau office at the Municipal Airport, Oakland, Calif., where a staff of five government weather men is kept busy at all times seeing that air mail and passenger planes, whose combined operations total 18 trips daily, are dispatched safely over their routes in all kinds of weather.

The office occupies a large wing of the airport administration building. Its quarters include two large office rooms and a small room on the roof for pilot balloon work. Commodious living quarters consisting of two rooms, bath and kitchenette are also provided.

Above—D. W. Merritt, minor observer of the U. S. Weather Bureau, starting a pilot balloon observation at Oakland Airport. Below—D. M. Little, assistant meterologist in charge of the station, receiving the reports from the observer

At all times, night and day, the office is a beehive of action. There are the twice daily reports received from all over the United States and from ships at sea to be worked out on a general weather map, the airways forecasts, pilot balloon reports, advice to pilots and local reports from the network of airways observation points to keep the Weather Bureau staff busy. The Experimental Meteorological Service of the Daniel Guggenheim Fund, which provides reports from 35 stations between Oakland and Los Angeles, is operated by the Weather Bureau from its Oakland office. Six reports are collected from these stations daily at intervals of 90 min.

All the weather information received at the office is posted on the huge blackboards that line the walls of the weather "work shop." In addition, maps are prepared showing the local cloud and fog distribution, as well as winds and storms. A special series of maps shows the wind direction and velocity at various elevations by means of arrows drawn on the faces of the special maps.

The speediest possible communication system, combining telephone, direct wire "printer-telegraph," radio and telegraph has been worked out. The printer-telegraph is the most unique feature of the Service. This machine, similar to brokers' "tickers," operates like a typewriter. Whatever is typewritten at Oakland is also written at the same time at various points throughout central and Southern California. These machines connect Oakland with Fresno, Bakersfield and Los Angeles. A printer is also in the district Weather Bureau office in San Francisco for transmitting the twice-daily continental and oceanic reports together with the forecasts. Another circuit connects with the Department of Commerce radio station at Concord for messages to and from other points such as Reno and Portland, with whom the Concord station communicates by radio.

Posting the weather reports on the blackboards at the Weather Bureau station, Oakland Municipal Airport

Most of the weather reports are collected by telephone. Oakland, Fresno, Bakersfield and Los Angeles simultaneously collect reports from stations in their districts and, at the same time, in the northern part of the state and in Oregon, reports are collected at Redding, Calif., Medford, Ore., Roseberg, Ore., and Portland.

The southern collecting stations, being equipped with printer-telegraph machines, send reports into Oakland by this method. The northern reports are sent to Oakland by telephone. The radio at Concord is used to keep pilots advised of conditions ahead of them when they land at various fields and send requests for the information by Department of Commerce radio. The Concord radio is also used to keep all pilots bound for San Francisco, or other points in the vicinity, advised of conditions in the Bay region and nearby points.

An Example of the Method Used

Let us suppose a pilot is getting ready to take off for Los Angeles. Reports are showing low clouds in the mountains. The "hump" is impassable. The pilot is waiting for the weather to clear. The weather man at the Bakersfield office telephones to one of the mountain observation stations.

"Weather report, please," he says.

In a few words the observer describes the state of the weather. In like manner, telephone messages bring word of conditions at points scattered all through the mountains. Immediately, the ringing of three short bells brings the Oakland meterologist to the printer-telegraph. The machine ticks off a message with steady beat, written on a tape:

"Lebec N lt fr clr o unl unl 23 26 81," the tape reads and continues, "Tehachapi E mod dense fog over fog O 75 ft 31 26 66." Interpreting this, the meteorologist knows that the pass through Lebec is clear. The wind is north and light, the weather is fair, there are no clouds, the ceiling and visibility are unlimited, the temperature 23 and barometer 26.81. On the other hand, Tehachapi has a dense fog; the wind is east, moderate; the sky is overcast with no ceiling; visibility 75 ft; temperature 31 and barometer 26.66. He then tells the pilot that he can fly over the mountains by way of Lebec but not to attempt Tehachapi pass.

On another occasion, flying conditions may be perfect, and it would seem that there is no need for all this weather service, once it has conveyed to the pilot the information that all is clear. But the Weather Bureau activities do not stop here. There is tomorrow to consider and forecasts must be made.

Pilot Balloon Information Most Valuable

But most important of all to a pilot in good flying weather is the pilot balloon information. No pilot likes a head wind. The much sought-for tail wind, if it exists at all, is pointed out to the pilot by the meteorologists at Oakland, who have supervision of nine pilot balloon stations in California alone. These stations are at Oakland, San Francisco, Hollister, Fresno, Redding, Lebec, Riverside, Los Angeles and San Diego. Information concerning upper air winds are also compiled for stations at Reno, Salt Lake City, Boise, Spokane, Medford, Portland, Seattle and Modena. Savings of as much as 30 per cent. of time in the air on a three hour trip are possible by proper use of the pilot balloon data.

The work of the Oakland Weather Bureau has made weather information so accessible to pilots, that many of the private pilots who used to pay little attention to the weather are now depending on the government's daily and hourly reports. Not only are the reports valuable, but the advice of the weather bureau men is also a great aid to the flier. For instance, who, but a meteorologist, can tell a pilot whether he can climb over extensive cloud banks, or if he must fly under the clouds or not at all? In a mountainous country, such questions are of first importance. At Oakland the airman is becoming more dependent every day upon the federal meteorologists to solve such problems for him. And they are being solved—scores of them each day.

The Oakland Weather Bureau has received wide acclaim and it is doubtless the model which will be followed throughout the country in establishing weather stations at the principal airports.

Aero Chamber of Commerce Organizes For Year's Work

F. B. Rentschler Is Elected President; Report Says Membership Has Doubled

NEW YORK, N Y Announcing that its membership has doubled in the last six months, the Aeronautical Chamber of Commerce held its annual meeting here late last month for the consideration of plans for further expansion of the organization's country-wide work in 1929 and the election of officers Leaders in commercial aviation in all parts of the country attended the sessions on January 26 and elected the Board of Governors of 21 The election of officers was held January 29 The annual report showed that the membership now includes 44 airplane manufacturers, 14 engine manufacturers, 14 air transport operators and several hundred industrial enterprises engaged in affiliated lines The individual memberships were said to have grown from 244 in January a year ago to more than 475 last month The membership is scattered throughout 33 states This rapid increase was credited largely to the successful operation of the decentralization of the Chamber into six geographical divisions. A seventh division, the Southeastern, is contemplated

Officers Elected

The officers elected are as follows President, F B Rentschler, vice president F S Bradley, secretary, Luther K Bell, treasurer, Owen A. Shannon Regional vice presidents Eastern, H E Pitcairn, north central, Edward S Evans, Great Lakes, Col Paul H. Henderson south central, Slyde V. Cessna, southwestern Harris M Hanshue, northwestern P G Johnson

The sectional vice presidents are airplane manufacturers, J Don Alexander, engine manufacturers F H. Russell, airship manufacturers, J Hunsaker, airports, Clarence M. Knox, Connecticut commissioner of aviation

The Chamber has been operating through a group of sections as well as divisions which include Commercial airplane manufacturers engine manufacturers transport operators, airships, airports, flying schools material equipment and supplies jobbers and dealers, fuel and lubricants publishers, aerial service, and photography and survey. The following general committees have been established also Show, insurance, arbitration, technical standards, aeronautical education, and Government relations

Projects Developed

Among the projects sponsored and developed by the Chamber in the last year are The standardized method of testing commercial aircraft the six standard requirements for listing of accredited flying schools, standard sales agreement form for manufacturers; agreement of transport operators to cooperate in the use of limited radio bands in flight communication, stimulation of air transport patronage investigation of fuel problems, development of new types of power plants attempt to educe fire hazards at airports through the insurance interests.

The aircraft industry is at that stage of development where it is encountering problems incident to the older industries says the report These problems have prompted special activities along such lines as uniform accounting methods, legal and legislative research, shipping, tariff and exports. Purchasing agents of the airplane manufacturers section were called to a special conference at Wichita January 22

In 1929 plans call for placing the Washington Service on a full time basis This branch has been very active in spite of its part time schedule heretofore. The local office of the Chamber practically doubled the size of its space during the year To meet the demand for aeronautical information, the library service and accommodations have been expanded considerably. Both trade information and publicity releases will be increased this year.

Shows Approved

The show policy as now operating calls for one big national annual show to be staged for the industry by the Chamber It has sanctioned a regional, air class B, show at Detroit in April and a class C, or local, show in Buffalo in March. The Chamber last year participated actively in the Los Angeles and Detroit shows, represented the American industry at Paris and Berlin shows, and conducted, through the Aeronautical Expositions Corp., the Chicago exposition

Representatives of the Chamber, headed by Major Gardner, reported to President Coolidge the progress of the Chamber in an interview at the White House the day before the annual meeting The President was lauded for his attitude toward aviation and was told that 'The recent growth of American aviation can be fairly credited to the sound policies which you have clearly defined and consistently followed'

Governors Named

The new Board of Governors of 21 includes J Don Alexander, Clyde V Cessna H F Pitcairn, S M. Fairchild, J. D Hunsaker, P. G Johnson C. L. Lawrence F H. Russell, F. B Rentschler Harris M. Hanshue, C H Colvin, J L. Callan, Edward S Evans, John R Coutley, C T Ludington, J. M Russell T Z Fagan E, S Bradley Paul H Henderson, Clarence M 'Knox and Maj L D Gardner

Six More Types Given Approval

WASHINGTON, D. C.—Approved type certificates for airplanes now number 102 with the recent addition of six planes to the list checked by the Aeronautics Branch The planes are as follows: No 97—Kreider-Reisner Challenger, three place open land biplane, Warner Scarab engine; No 98—Buhl Senior Airsedan, eight place closed land sesquiplane Wright Cyclone; No 99—Buhl Senior Airsedan, eight place closed land sesquiplane, Pratt & Whitney Hornet No 100—Travel Air 6000, five place closed land monoplane, Whirlwind; No. 101—Brunner-Winkle Bird, three place open land biplane, OX-5, and No. 102—Lockheed Air Express, five-seven place closed land monoplane, Waap.

Consolidated Aircraft Interest is Purchased

NEW YORK, N Y.—A substantial interest in the Consolidated Aircraft Co. of Buffalo, N Y., has been acquired by Pynchon & Co. of this city, it was announced recently. The transaction is said to involve a redistribution of stock for purposes of listing on leading stock exchanges. An issue of common stock has been announced by the Pynchon company.

Consolidated has been specializing in training planes for the Government during the last five years and has done considerable pioneering in the design and construction of large flying boats Operations are being expanded but there will be no reorganization of the staff at present, it was stated by George M Pynchon Jr

Name Butler Directors

KANSAS CITY, MO—Directors of Butler Manufacturing Co., this city and Minneapolis, Minn., elected by the stockholders for this year are Charles R. Butler, E. E Norquist, C C. Crouch, William A Knapp, Roy S Kemp, F. A Rufi, Oscar D. Nelson, and William C. Glover. All officers of the company were reelected E E. Norquist is president and general manager

Acosta to Build Planes

NEW YORK N Y—Entrance into the aircraft manufacturing field and organization of the Acosta Aircraft Corp to produce what is termed "a new type plane," is announced here at the first's headquarters in the Transportation Building. The Mercer Automobile Co. at Trenton, N J., has been taken to serve as a factory, it is reported.

Name Thomas Morgan Sperry Company Head

BROOKLYN N Y—Thomas A Morgan it is announced by the Sperry Gyroscope Co, Inc., of this city, was elected president of that organization at a recent meeting of the stockholders of North American Aviation, Inc, which a short time ago purchased the firm.

R E Gillmor was elected vice president and sales manager, Capt. Thomas B Doe, vice president of North American Aviation, Inc was elected vice president, H H Thompson was named secretary, and O H Rughaase, assistant treasurer

Mr Morgan, who is also vice president of the Curtiss Aeroplane Export Corp, a major in the U S Army Reserve Corps, Ordnance Division, and well known in naval military aviation and shipping circles, became associated with The Sperry Gyroscope Co upon his leaving the naval

Thomas A Morgan

service in 1912. He has announced that there will be no change in the organization or policies of the Sperry company except to increase the scope of its activities

Elmer A Sperry who was chairman of the board of the Sperry firm will now devote himself entirely to the Sperry Development Co

Roma Reported Sold

NEW YORK, N. Y.—Announcement is made here that the Bellanca sesquiplane Roma has been sold to Lieut Claudio Mejia and Diego Arzeno, Argentinians who plan to fly the craft non stop from Beunos Aires to Seville Spain, in March The route planned involves a flight of some 3,170 mi

B. & D. Drill Price Reduced

TOWSON, MD.—Price reduction from $28 to $25 on ¼ in light duty drill is announced by the Black & Decker Manufacturing Co, this city. The drill is a general purpose instrument for light work.

American Eagle Acquires Engine

KANSAS CITY MO,—Manufacture of the Hudson-Hawk six-cylinder aircraft engine has been taken over by the American Eagle Aircraft Corp. of this city, according to Finn S Hudson, who developed the power plant. The Hawk engine, designated as Model 6-100, is an air-cooled static radial. Specifications are as follows: Bore, 3¾ in.; stroke, 5 in; displacement, 354 cu. in.; output, 100 hp. at 1800 r.p.m.; overall diameter, 33 in.; weight without supercharger, 325 lb.

Production "Arrow" Cabin Plane Tested

ST LOUIS, MO.—A rigorous program of flight testing has been begun for the first Parks "Arrow," the new cabin monoplane to be manufactured in quantity by Parks Aircraft, Inc at Parks Airport

Under instructions of Harry P. Mammen president of the manufacturing company, Lieut Edgar C Schmid, test pilot and Adjutant of the 35th Division Air Service now has the big monoplane in the air daily making notes of its performance under all conditions.

In its preliminary test flights the plane registered a performance said to have exceeded the expectations of the engineers Starting from a muddy field on its second flight the craft got into the air after a run of only 66 ft A second test plane will be ready for flight shortly

Prepare for New York Show

NEW YORK N Y.—As we go to press preparations are being completed for the opening of the New York Aviation Show in the Grand Central Palace, scheduled for February 6-13 At the 71st Regiment Armory, school boys of New York and the vicinity have entered model planes, gliders, dirigibles in the contest being held in connection with the Show Winners are to march from the Armory to the Grand Central Palace on the opening day of the exhibition where prizes are to be awarded by Lady Heath, Clarence Chamberlin Amelia Earhart, William Brock, and Edward Schlee.

Kinner in New Plant

GLENDALE CALIF — The Kinner Airplane & Motor Corp is now completely installed in a new plant located at 635 West Colorado Boulevard, Glendale, Calif The new plant including test houses covers approximately two and one-half acres and is completely equipped with the most improved type of machinery tools and equipment for the accurate production of airplane engines on a quantity basis

Hamilton Joins United Aircraft

Metalplane and Propeller Firms Absorbed by Holding Company

NEW YORK, N Y—The Hamilton Metalplane Co and the Hamilton Aero Manufacturing Co, manufacturer of propellers, have been absorbed by the United Aircraft & Transport Co which is the name of the holding company controlling the Boeing Airplane & Transport Co., the Pratt & Whitney Co., and the Chance Vought Co Mr Thomas Hamilton who has been the active head of both the plane and propeller companies, started in the propeller business in 1909, his first propellers being flown in 1910 In 1911 Mr. Hamilton built his first plane and taught himself to fly Due to his long experience Mr Hamilton has achieved a foremost place in the propeller building business and his propellers are standard equipment on many military and commercial planes

Expansion is Planned

The Hamilton Metalplane Co produced its first plane in 1926 and these machines are being used by the Northwest Airways, the Scenic Airways Northern Airline, Wein Alaska Airways and the Andean National Co in South America. The Hamilton Metalplane Co will become a division of the Boeing Airplane Co. but it is expected that building operations will be continued in Milwaukee, which is the present location of the plane plant. The Hamilton Aero Manufacturing Co, which builds propellers both of wood and metal, will materially increase its capacity, floor space will be tripled and present machinery will be doubled

The absorption of the Hamilton interests by the Boeing Airplane & Transport Corp of Seattle is being worked out simultaneously with the change of name of that company to the United Aircraft & Transport Corp and an increase of preferred stock from 200,000 shares to 1,000,000 shares and of common from 650 000 shares to 2,500 000 shares

Cornell May Get Air Course

ALBANY, N Y.—A course in aviation would be established at Cornell University, Ithaca, under provisions of a bill introduced in the legislature by Assemblyman Edward J Coughlin, of Brooklyn a member of the state aviation committee. The measure asks an appropriation of $150 000 for this purpose

Claims Fireproof "Dope"

ST PAUL MINN.—Discovery of a new formula for airplane wing "dope" which is claimed to be virtually non-inflammable has been announced here by G Schubert Knapp.

Plan of Gardner Race Announced

Annual Trophy Event Will Include Two Phases; Engine Size Restricted

ST LOUIS, MO—Detailed plans for the Gardner Annual Trophy Race for commercial airplanes, to be held in St. Louis on May 28 and 30, are announced by T Preston Sultan, referee, and Maj Albert Bond Lambert, chairman of the contest committee.

The race is unique in that it is to be divided into two phases the first being a five fold elimination contest from which the contestants will be selected for the second phase. Strictly a speed event with no limitation on design of contesting planes the race has only one restriction for contenders That is that no contesting engine shall be of more than 800 cu in displacement

Headquarters for the race have been established at 220 Missouri Theater Building, St. Louis Inquiries about entrance to the race should be addressed to E Roy Alexander, race manager, at that address

The first phase of the contest consists of five separate and distinct races from the following starting points Buffalo N. Y., Jacksonville, Fla; San Antonio Tex., Denver, Colo, and Fargo N. D Contestants may elect to race to St. Louis from any of the points, which are chosen so that pilots may have a starting point as close as possible to their home airport

Preliminaries Carry Prizes

From each of the starting, or control points the contenders will be started at 5 A M local time, on May 28 The first to arrive at Parks Airport will of course be the winner in his division. Each of the five preliminary races carries a first prize of $750 and a second prize of $250

The second phase of the race is open to the winners of the first and second places in the preliminary races, a total of 10 planes On May 30 they will take off from Parks Airport, race to Indianapolis, turn a pylon there over the speedway during the Memorial Day race and swing back toward St Louis The flier who makes the round trip in the fastest time wins the $5000 put by for the final race

In this phase, as in the first, pilots may stop on the way if circumstances dictate a stop without suffering any penalty beyond the delay incurred.

N-B Has Mexican Depot

MARSHALL, MO — Nicholas-Beazley Airplane Co. of this city has established its second foreign representative acting as an aeronautical supply export depot at Mexico City under the direction of G. N Anderson, president of Cia Suriana Del White S A. Calle Nuevo Mexico No 122 Mexico, D. F. The latter company is prominent in Mexican trade circles as exclusive distributor for the White Truck

To Test Boeing Transport Soon

SEATTLE, WASH.—Boeing company officials announce that the first of the new 18 place, trieangined Boeing transports will be on the municipal airport here for trials on or about March 1. The plane is now on the floor of the local factory and will be given the right-of-way over other commercial construction.

It is planned to construct 12 of these planes Eight will go to Boeing Air Transport for building up passenger service between Chicago and San Francisco. The other four, it is announced, may be assigned to the Pacific Air Transport to furnish similar service between Seattle or Los Angeles.

Eastern Idaho Service Plans School in Spring

POCATELLO, IDA—Eastern Idaho Air Service, Inc., this city, announces an aeronautical training school to be opened this spring at the Pocatello Municipal Airport. Calvin Moser is president of the firm, and E L. Anderson is vice president

Several courses will be offered, with ground school conducted by an expert at an uptown school room Furthermore, a complete mechanical course will be available next fall Instruction will be given, it is said, on new production engines as well as the old.

Arrangements are now underway to build a steel hangar 80 by 60 by 14 ft, with a lean-to 20 by 60 ft for shop and office The structure is to be ready within two months Eastern Idaho Air Service is Idaho distributor for Swallow planes

Bolte Plane Ready Soon

DES MOINES, IA—The Bolte Aircraft Co. announces that its first planes will be upon the market March 1 the plant operating with a schedule of two planes a week for the first weeks until capacity of three planes daily is reached The Hoddy Mulligan Sales Co., Kansas City has offered to handle entire production of the factory. One model and six stock planes are now in course of construction

Levine Firm Product Tested

ROOSEVELT FIELD L I—Known as the "Tried" the first commercial cabin plane of Columbia Air Liners Inc of which Charles A Levine is president was tested here on January 26 by Roger Q Williams and Lieut. Comdr Jack Iseman both test pilots for the Columbia firm The craft a five place Whirlwind J-5 powered monoplane is reported to have performed satisfactorily in the four flights made

Dr. Reed Settles Suit of Standard

Reports Litigation Over Propeller Infringement Ended by Agreement

NEW YORK N. Y—Dr S Albert Reed of this city has announced that suits against the Standard Steel Propeller Co. and the Government involving alleged infringements of his patents on a metal propeller have been withdrawn following a satisfactory settlement between himself and the Standard company

The agreement provides that the Standard company will pay Mr Reed a small indemnity for the use of the invention in the past and will receive a license to manufacture metal propellers bearing Reed's name in return for which a royalty is to be paid for each propeller turned out

The suit was started in 1924 The Government was sued also as propellers were being manufactured for the Army and Navy in which he claimed his processes were being used. A decision expected last October was postponed on application of both parties involved pending the outcome of the recently-announced negotiations

The Reed propeller is being manufactured now in this country, Great Britain France, Germany, Holland, Italy, Czechoslovakia and Japan Mr Reed won the Collier Trophy in 1926 for the most distinguished service to aeronautics in that year

Old Lincoln Aircraft Has Reorganization

LINCOLN, NEB—The Lincoln Aircraft Co., Inc. has been organized under the laws of Delaware to take over the Lincoln Aircraft Co said to be the second oldest commercial aircraft manufacturing company in this country and the operator of the school at which Colonel Lindbergh received his first flying training Victor H. Roos is president of the new corporation Ray Page vice-president and director of sales; Charles Carroll O'Toole, secretary-treasurer.

The old company is reported to have built and sold 61 planes in 1927, 131 in 1928 and the new concern plans to turn out 500 machines at the Lincoln, Neb., plant this year

Brown Deer Has Pioneer

BROWN DEER, WIS—This small town, just north of Milwaukee, boasts of one of the most experienced of airmen, a pioneer with 8 500 hr to his credit amassed in years of flying since his first air trip in 1910 at Frankfurt-am-Main Germany, when he was 16 yr old This pilot is Fritz Holterhoff, who now has his own airport at Brown Deer The Wright Brothers first interested Holterhoff in flying when they staged an exhibition at Frankfurt in 1909

Bliss Jupiter Makes High Record in Test

PHILADELPHIA, PA.—The Bristol Jupiter engine now being produced in the United States by the E W. Bliss Co, under exclusive license by the Bristol Aeroplane Co, Ltd., England has just completed official tests by the Naval Aircraft Factory, at Philadelphia and has been approved for use in aircraft licensed by the Department of Commerce establishing one of the highest efficiency records of any engine licensed for use in the United States according to a report to the Bliss Co, from Clarence M Young director of the Aeronautics Branch, Department of the Commerce

The Jupiter engine which has for a number of years held distinctive service records in practically every country of the world and is used on the principal European airlines, completed the 50 hr test without breakdown or replacement of parts The tests conducted under Navy specifications, included the final five hours running at full throttle

The Bliss Jupiter, in these tests, developed a corrected brake horsepower of 460 at 1765 r.p.m., indicating a high efficiency The average specific fuel consumption at full throttle was .559 lb. per brake horsepower hour and a minimum fuel consumption of .484 lb. per brake horsepower hour on the propeller lead at 1585 r.p.m The corrected brake mean and effective pressure was 119.5 lb and the specific dry weight of the engine was 1.74 lb. per horsepower

Special Eagle Cabin Plane Passes Tests

KANSAS CITY, MO.— The custom built twin engined cabin monoplane, constructed for Dr Walter M Cross, a Kansas City chemist, by the American Eagle Aircraft Corp has successfully undergone initial tests at Fairfax Airport here

Piloted by Howard Jones of Wichita the big monoplane powered with two 125 hp Siemens Halske engines took off in about 200 ft and showed a cruising speed of approximately 90 m.p.h with the engines throttled down to about three-fourths of their normal r.p.m

The monoplane has a wingspread of 47 ft. and an overall length of 27 ft 6 in. It weighs approximately 1,700 lb and its useful load is about 800 lb. The plane carries 150 gal of fuel in five tanks, gravity fed to the engines, and eight gallons of oil

The engines are mounted at the sides of the fuselage nose the pilot riding in the nose and having a full vision range at all times A twin rudder arrangement is used.

Southern Aero Orders Ford

NEW ORLEANS, LA. — Southern Aeronautical Service, Inc this city, has placed an order for a Ford Stout trieangined plane, according to Capt. R. H Polk, president of the company The craft will be used on the New Orleans-St. Louis line planned by the firm.

Curtiss Plans New School

KANSAS CITY, MO—The Curtiss Flying Service Co, operating a chain of flying schools in the East, will open a school at Fairfax Airport, Kansas City, Kan., early in the summer, according to C S 'Casey' Jones, president of the company Mr Jones, in company with F L Hale, his assistant, visited the Fairfax Airport recently in order to inspect that field for use as a field in connection with the school

Naval Flying Boat Has Commercial Prospect

WASHINGTON, D C—A giant Navy flying boat, convertible into a passenger-carrying craft with accommodations for 32 in addition to the crew passed tests of the Navy Department at the Naval Air Station here recently The machine has two Wasp engines, a high speed of 120 m.p.h and a cruising speed of 110 m.p.h a wing spread of 100 ft, length over all of 60 ft, and weighs 13,600 lb

The builder Consolidated Aircraft Corp Buffalo, N Y, is said to have several commercial orders contingent on the acceptance of the machine by the Navy The huge boat is reported to be under consideration by the Detroit and Cleveland Navigation Co which is working on a service between the two cities in the spring Secretary Warner was said to have expressed the hope that purchase of the plane by the Government would assist the commercial development of large flying boats in this country, which has been neglected

The plane exceeded the Navy specifications it is the result of the 1928 competition for development of a naval flying boat and rout the government $150 000 It is reported that a third engine will be installed on top of the wing, giving, it is estimated a cruising speed of about 110 m.p.h As a naval plane, it carries a crew of five

Statement Concerning Advance Firm Issued

The following announcement has been received from C J Brukner, president of the Advance Aircraft Co, Troy, O, maker of Waco airplanes

"In response to many inquiries evidently resulting from the impression created by certain newspaper stories which have appeared in various cities relative to the ownership of the Advance Aircraft Co. the following accurate information is submitted to be used as desired:

"The officers of the company are C. J Brukner president, L. N Brutus vice president and treasurer, and L E St John secretary. These same men are all of the directors of the company and own in excess of 99 per cent of the outstanding stock

"Stories representing other persons as directors or large stockholders are incorrect and while this announcement implies no malicious intent on the part of anyone, it is intended to offset the results of incorrect reports."

Curtiss to Add Photo Division

Acquires Hamilton Aerial Maps For National Cooperative System

NEW YORK, N Y—Recent acquisition of Hamilton Aerial Maps by Curtiss Flying Service, Inc., makes possible a national aerial photographic service in which local photographers all over the country may participate on a cooperative basis, according to statements by the Curtiss company

Plans for this service call for the distribution of aerial cameras by a photo division of the Curtiss organization which will also furnish instructions and technical information to the cooperating members and advise and aid them in mapping and printing topographical charts for guidance in making photographic aerial surveys.

In addition the facilities of an aerial photographic laboratory, together with a staff of technical engineers, will be placed at the disposal of photographers cooperating in the service. This will relieve local agencies of the developing printing and combining of the hundreds, and often thousands, of pictures taken in a photographic survey.

Hamilton Heads Service

W. L Hamilton former head of Hamilton Aerial Maps, will be in charge of the photo division which the Curtiss Flying Service will maintain in conjunction with taxi services, training schools, and airplane distribution centers it plans for 25 or more cities.

Hamilton, who has devoted the past eight years to the development and perfection of aerial photography, said that the new service would place it on a quantity production basis for the first time and bring aerial surveying within ready and economical reach of innumerable individuals and organizations who might utilize it to great advantage.

Two Waco Dealers Named

KANSAS CITY, MO —Two new dealers for Waco planes are announced by "Tex" LaGrone, Advance aircraft distributor here One is the Shappell Flying Service, Sedan, Kan, of which Dale Shappell is chief pilot, while the other is the Allton Flying Service of Columbia Mo, of which Roe Montgomery is chief pilot The first OX-5 Waco 10 will be delivered immediately to the Shappell company, while the latter firm will take delivery on its second Waco February 15

Represents Mono Aircraft

KANSAS CITY, MO—With a territory including Missouri Kansas, and northern Oklahoma the Beacon Airways Corp, this city, will take over the distribution of Monocoupe planes, it is announced

Try Wing Slots On Navy Vought

Cockpit Control Device Employed in Test Flights Made at Mitchel

MITCHEL FIELD, L I—Tests were conducted here recently with a Wasp powered Vought Corsair biplane equipped with Handley Page slots Installation of slots on the airplane followed negotiations in which the United States Navy obtained a license to use this device on the wings of any Army or Navy plane This privilege was obtained from Handley Page Ltd, which controls the patents for this safety device

In the course of the tests the plane was flown to an altitude of 10 000 ft and deliberately put into a fast spin by the pilot Lieut. C B Harprr, of the U S Naval Air Service After some 10 turns were completed the slots were unlocked by the pressure of a lever in the cockpit and the plane recovered from the spin in a half turn

Lock Device New

This installation is said lo be the first in which provision has been made to lock the slots under normal flying conditions and release them when necessary In most cases the devire functions automatically The advantage of the locking featnrr lies in the fart that maneuverability and other performance characteristirs are noi affected by the presenre of the slots when they are in the lorked position A considerable redartion in landing speed alsa was noted in the lests.

Another loteresting fact brought out by lhe long serics of tests conducted with the plane was the effect of ice formation on the funrhioning of the slots On one of the flights made under adverse weather conditions, a heavy coating of ice formed

Vought with slotted wing device shown in open position.

on the plane and as reported to the National Advisory Committee for Aeronautics, failed to interfere in any way with the operation of the slots

Al the coochision of the tests it was pointed out by Chanre Vought that the engineers of his company were the first to develop the slot installation on wings having sweep back, whirh is a characteristic of many military planes He also stated that the device should prove particularly valuable in naval planes designed to land on airrraft carriers

Eastern Capital Backing Cessna

WICHITA, KAN — Eastern capital has gone into another aircraft corporation in Wichita The Cessna Aircraft Corp. has received the financial support of the Shawmut Corporation of Boston and New York with H. A. Kenyon, its rapresentative, well-known in Wichita, taking a place on the Cessna board.

The Shawmut Corporation's interest in Cessna is about $300 000 of the $500 000 recapitalization Expansion plans of the company are to be carried oul in the near future Additions will be made to the present big factory Henry J. Allen, W B Harrison, C. V. Cessna, W. H. Barnes, and Kenyon now comprise the Cessna board Mr. Cessna is president.

Alexander Installing New Factory System

COLORADO SPRINGS COLO—Annonrrement he had retained Stevenson Harrison & Jordan of Chicago management engineers, to survey production methods in the Alexander Arrcraft factory and install a system of production control is made by J Don Alexander president

Servires of prodinrtion engineers were obtained in line with the rompany s program of increasing production 300 per cent in 1929 The concern systematized production at the Rolls Rovce, Ltd factory in England

An installation engineer has started preliminary work loward establishing straight-line production A supervising engineer will spend several days each month overseeing the work

In arrordance with the program of prodiction expansion the Alexander company is contemplating the adoption of a system of standard costs.

"Alclad" a Trade Mark

In a rrrent lelter, S A Hartwell Jr of the Aluminum Company of America, calls attention to the fact that the word "Alclad" is a palenled trade mark to be usrd rorrectly in the form of an adjective rather than a noun, the valid usage being "Alclad aluminum alloy sheet." The title of the feature story in lhe Dec 22 1928 issue of AVIATION should therefore have read, "Application of Alclad Alumimum Alloy Sheet to the Aircraft Industry" rather than "Application af 'Alclad' lo the Aircraft Industry!"

Fairchild Plans To Make Genet

Secures Rights to Build English Engine; Will Be Used in Model 21

FARMINGDALE, L I—Thal the Fairchild Aviation Corp has acquired production rights for the 65-75 hp. Armstrong-Siddeley Genet engine in this country is now announced. With a few necessary modifications, these power plants will be manufactured in quantity by the Fairchild firm at Farmingdale for use in the new low-wing Model 21 plane Fifteen of the engines have already been imported for initial use.

Specifications of the Genet follows Type stalir radial air rooled five cylinders 4 in. by 4 in, displarement 251 2 cu in; compression ratio 5 2 to 1 output, 65-75 hp at 1,850 rpm; fuel consumption, 58 pints per hp hr., oil consumption, 05 pints per hp hr; weighl 176 lb

The five steel cylinders are screwed into steel adapters located in the aluminum crankcase, where they are locked with a double cone lockring The aluminum alloy semi spherical heads are shrunk screwed and locked to the cylinders in the same manner as on the firm's "Jaguar" power plant. There are two inclined overhead valves per cylinder, the exhaust being made of cobalt chrome and the inlet of stainless steel Duplex valve springs are fitted the valves being controlled by tubular steel push rods which are operated by roller-ended tapprts and a slow-speed cam ring driven by the crankshaft through the medium of an epicychc gear. The crankshaft runs on ball bearings the front main bearing taking the propeller thrust, while the propeller journal loads are taken by a plain bearing contained in the fronl cover, which also serves as an oil retainer for the oil on its way from the pump ta the crankshafl.

Two Magnetos Provided

The master rod is made in one piece, while the master ring and the auxiliary rods are of H section The "V" alloy forged pistons are fitted with two compression rings and a scraper ring above the floating gudgeon pin, and one scraper ring below it. Ignition is provided by two accessible placed magnetos driven by bevel gearing from the crankshaft. The mixturr is supplird by a Zenith carburter a mixing fan being provided in the induction system as on the other Armstrong Siddeley aviation engines The lubrication relies on the dry sump system, the pump unit rncorporating the pressure and scavenger pumps which are driven by bevel gearing from lhe crankshafl and the pumps being situated under the front cover where they are readily accessible The scavenger pump, which is 50 per cent larger than lhe pressure pump, transfers the oil from lhe engine lo lhe tank, the pressure pump being relied upon to feed the lubricant from the tank to the crankshaft

Six New Aeronautical Groups Being Formed

NEW YORK, N Y—Six airrraft concerns have been announced recently as organized or contemplated for early operation The names, purpose capitalization and organizers are as follows

The Frrgus Falls Air Service Inc, Fergus Falls, Minn, passenger lines, $50 000, Rupert C Anderson, C W Bondr Orris E. Berggrud and Philip Aunr The Miami Airways Miami Fla, Fred W McKay, Henry W. Mittag and others.

Santa Monica Aero Corp., Santa Monica, Cal, $10 000 John W Kilgore, Elwood Humble, John Conzelman Albert L Hardiogmand, W R Niedrick The Washington Air Express Seattle, Wash; air transportation, $252 000; Jay Todd, August F. Slater and Bernez Northern.

East Coasl Aircraft Sales Corp, Boston, Mass., general flying and sales, $100, 000 Fred L. Ames, sole organizer Myron P. Lewis is vire-president, S G Wilbas, secretary, and Frank Le Man sales manager. The company has the New England Travel Air franchise and will represent Keystone Loening.

A concern, as yet nnnamed, is being organized at Carroll la, to manufacture aircraft Capitalization is said to be $125,-000 and lhe staff to include Glenn C Boyer and C. L. Ofenstein. The promoters are W. L. Saul. L R Chapman, and R. W Humphrey

Oakland Negotiating For Test Equipment

OAKLAND, CALIF.—L S Nagle, president of the Oakland chapter of the National Aeronautic Association, has gone to Washington, D C, to negotiate for the first lot of instruments to be used at the Oakland Municipal Airport aircraft proving ground.

The Board of Port Commissioners which controls local airport affairs, is assisting the N A A chapter in the establishment of the proving ground and has authorized the purchase of three F A I certified stop watches, two high-altitude barographs and two barographs for endnrance and low-altitude flights

Measured courses will be established at Oakland Municipal Airport in the near future in order that manufacturers may test their planes here and receive official performance certificates for their craft.

Taylor Brothers Plan Move

ROCHESTER, N Y—According to H M. Shaw, secretary and general manager the Taylor Brothers Aircraft Corp here is soon lo move to Bradford, Pa., into a plant to be built al Emery Field

N.A.C.A. Bibliography Issued

WASHINGTON, D C.—The National Advisory Committee for Aeronautics has issued the 1927 Bibliography of Aeronautics Price, 35 cents.

To Produce Many Engines

BELLEVILLE, N J—Present plans of American Cirrus Engines, Inc., call for a prodnrtion of five engines a day by April 1 and 10 engines daily before July 1 according to a company announcement.

Eaglerock Salesmen Gather in Conference

COLORADO SPRINGS, COLO—So successful was the first national sales conference of lhe Alexander Aircraft Corp, whirh recently closed here, that it probably will become an annual affair

Fifteen distributors and as many dealers attended the three-day session Every visitor took the opportunity to fly the new experimental plane whirh the Alexander company expects to produce in large quantities this year Delegates praised it.

A new wholesale finance plan which enables distributors and dealers to keep Eaglerocks in stock at small mitral investment met with the hearty approval of the distributors. It was presented by R. A. Duncan, secretary treasurer of the organizatoo The rompany has arranged with a New York concern to finance purchases under its provisions

Dr. D. B. Harmon of Colorado College, secretary 10 charge af the Alexander Eaglerock aeronautical scholarship contest, discussed new developments in the rompetition Students of 169 colleges are now competing for the free Eaglerock, or four year scholarship in aeronautics, which will be awarded the winner.

The convention closed with a banquet in honor of the guests at the Cliff House in Manitou

Flying Club Chapters Proposed For N.A.A.

WASHINGTON, D C—Believing that there is a definite field for lhe operation of flying clubs in this country and that such operation may best be national in scopr, the committee of lhe N A A. appointed to study the situation has tentatively recommended provision for organization of private flying clubs within the association as chapters

A standard sel of rules lo facilitate organization and operation of these clubs has been devised and is promised for distribution soon. A rentral committee is seen as a suitable coordinating agency to supervise the work of all lhe individual chapters One of its servires might be, for instanre, some form of group insurance for flying equipment, a subject whieh is being investigated now

Logan to Handle Rankin Plan

CLEVELAND O—The Floyd J Logan Aviation Co of 716 West Superior, this rity has just taken on the distribution of the Rankin System of Flymg Instruction for Ohia and the greater portions af the states of Kentucky West Virginia and Pennsylvania.

N.A.A. Announces 15 "Planks" in Program

WASHINGTON, D C—The 15 planks" of the 1929 program of the N A A., rerently announced, follow, in part

Adequate and thorough training for civilian pilnts and development of the artivities of organized reserve aviation in Army and Navy The formation of flying clubs. The continuation and perfection of an indnstrial war plan system

The enactment of uniform state aeronautical legislation The maintenance by the Government of an adequate network of meteorological stations The enactment by Congress of legislation to correct injustices wrought against the personnel of the Army Air Corps Participation in such international rompetitions as will maintain this country's prestige Urging upon every rommonity in the United States the importance of the establishment of adequate air navigation facilities, such as landing fields and airports.

The development of rigid airships for the purposes of trans-oceanic and intercontinental travel and for the Navy The rncouragrment of American aircraft in foreign rnntries The prompt construction for the United States Navy of additional aircraft carriers The completion of the five-year programs for the Army and Navy The continued expansion of the air mail system and its use and development of lines lo Central and South America

Two Washington Aero Clubs in Consolidation

WASHINGTON, D C—With a membership of approximately 200 of lhe most prominent aviation authorities in the Capital, a new aeronautical organization was created at a recent luncheon by a consolidation of the Aero Club of Washington and the District of Columbia chapter of the N A A. The group will continue under the name of the former club, yet will function also as the N A. A chapter

The new body elected as its first president Col C de F. Chandler, U S A., retired The followmg officers were elected in serve with Colonel Chandler: Vice presidents, Adm D W Taylor, retired, A Barta and Henry Berliner, secretary, Allen Smythe, treasurer Carl F Schory, rerording secretary, Earl Findley, trustees Charles J Bell Dr A F Zahm, Porter Adams, and G W Lewis

Would Enlarge N. A. C. A.

WASHINGTON D C.—Senator Bingham, of Connecticut has introdured a bill in Congress increasing the membership of lhe National Advisory Committee for Aeronautirs from 12 to 15 members It is provided lhat the three additional members to be appointed by lhe President shall be acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences, and shall serve as such without compensation.

Personnel

HARRY D COPLAND, vice president of the Interstate Airways Corp of Hartford Conn., has resigned to become Hartford manager of the Curtiss Flying Service of New England. GEORGE H PHELPS, of Hartford, who made his first flight less than a year ago and has received his transport license under Copland's tutelage, is manager of Interstate Airways

PERCIVAL H SPENCER, former president of the New England Aircraft Co., which the Curtiss Flying Service of New England has bought will be general sales manager for the latter

MASON SEARS, former treasurer of the Boston Airport Corp., which the Curtiss Flying Service has taken over, CHIEF PILOT RALPH WICKFORD PILOT ADOLPH BACKSTROM and TRAFFIC MANAGER FRANK LE MAY are to have the same positions under the new arrangement RAYMOND P BALDWIN former president of the Boston concern is to be either president o fthe Curtiss organization or chairman of the board of directors

MAJ. ROBERT G. ERWIN, Air Corps Reserve and formerly flying aide to Assistant Secretary of War Hanford MacNider is to be vice president and general manager of the Curtiss New England group.

LIEUT ROBERT M WEBSTER who has been stationed at Camp Nichols Philippines for two years, will succeed Lieut Louis N Eller as Regular Army instructor to the 43rd Division Air Service at Brainard Field, Hartford, Conn Lieutenant Eller has been ordered to Panama

HAROLD CRARY, who has been publicity manager for the American Air Transport Association, has resigned to become advertising and publicity manager for the various Boeing enterprises WINSOR WILLIAMS, assistant secretary of the Chicago Aero Commission, will take his place

W E BOEING has been re-elected chairman and P G JOHNSON, president, of the Pacific Air Transport. Other officers elected at the company's annual meeting include: A. K HUMPHREYS of Seattle vice president, C BRADSHAW, Portland secretary; O W. TUPPER, Seattle, treasurer; E BRINK Seattle, auditor. Col. JOHN C. BEATTY is a new member of the board of directors.

N. N. TILLY, formerly civilian chief engineer at McCook Field, Dayton O., has taken over his duties as chief engineer of the Kinner Airplane & Motor Corp., Glendale, Calif.

R. W. CONROY, war-time flying instructor in the Marine Corps and a member of the Marine Corps Aviation Reserve, has been appointed aero sales manager of the replacements department of the Russell Manufacturing Co., Middletown, Conn

CY 'SHORTY' BITTNER, formerly with the Gates Flying Circus has been appointed reserve pilot for the Colonial Western Airways, Inc

THOMAS T HILDEBRANDT has been appointed manager of the aeronautical division of the Commercial Investment Trust, Inc., New York City

ALEX HOLDEN, has been made president of the Washington Aeronautical Corp of Tacoma, Wash. The company conducts a school, is distributor for five airplanes and has the fire patrol contract for that district.

JACK I BURSON of Youngstown O formerly with Parks Air College is assistant manager of the W-I-L Airschool Inc of St. Louis which has an airport at Granite City, Ill. LEROY OSBORNE, former instructor in the Causeway Air School at Miami, Fla. is chief instructor for the W-I-L ground school

B. H. JOHNSON and GEORGE H SMITH, both of St. Louis, will be traffic manager and mail traffic manager, respectively, at the new Kansas City office of the Robertson Aircraft Corp. of St. Louis, which is operating a mail and passenger service between the two cities and plans a connection with Omaha soon.

CAPT. HOLDEN C RICHARDSON, designer of the NC flying boats and pilot of one of them on the Newfoundland-Azores flight attempt, is to retire from the Navy and will take a position with the Great Lakes Aircraft Corp which has taken over the plant of the Glenn Martin Co. at Cleveland. He is considered an authority on floats and hulls for seaplanes and flying boats

H H CRITES, former aeronautic expert with the Los Angeles Chamber of Commerce has resigned to be production manager of the Fokker plant at Wheeling, W Va. He will supervise production at the Los Angeles plant in about six months.

H. G GRIFFITH, Aurora, Ill., has been elected director of the Midwest Airways Corp. at a recent meeting

L. M. KORNLEY has entered the sales department of the Minneapolis branch school of Air Service, Inc

EDWARD S EVANS of Detroit has been elected president of the Curtiss Flying Service of Michigan. Other officers are: first vice president, CHARLES S. "CASEY" JONES of New York, second vice president and general manager C. V. BURNETT, secretary, PAUL STRASSBURG and treasurer, J A B SMITH

R. H BERRY, Tulsa, Okla. has been named chairman of the Oklahoma State Chamber of Commerce aviation committee. Others on the committee include: H. C MARTIN Oklahoma City, vice chairman; EARL P. HALLIBURTON, Duncan, PAUL BRANIFF, Oklahoma City, C. C. ROBERTS, Tulsa D A MCINTYRE, Tulsa, GLEN CONDON Tulsa; H C. MULROY, Ponca City WILLIAM PARKER, Bartlesville, BURRELL TIBBS, Oklahoma City; CHARLES PARKER Tulsa and A. E WARNER, Oklahoma City

Trade Tips

It Has Been Reported That—

—Installation of new shop equipment is planned by the Arkansas Aircraft Corp., which maintains offices in the A.O.W.U. Building, Little Rock, Ark

—Transcontinental Air Transport, Inc., is taking bids on construction of an airport station at Dodge City, Kan. to cost about $25,000

—The Sikorsky Manufacturing Corp., College Point, N. Y., is taking bids on construction of a $500,000 factory building at Bridgeport, Conn.

—National Aviation School, 809-15 West Market Street, Louisville, Ky., is planning the establishment of a monoplane manufacturing plant

—The Eberhart Aeroplane & Motor Co, Hamburg, near Buffalo, N. Y., will soon begin construction of an assembly plant This company, it is reported has developed a new type sport plane

—Alfred MacDonald, superintendent of Wichita's park system, who will have charge of the new 640 acre municipal airport at that city, announces that a contract will be let before the middle of February for the first of several buildings for the airport. A $63,000 hangar is to be erected first, to be followed by a $70,000 administration building. The field will be lighted by May 1, the date set for completion of the main structures

—Operating bids for a new air mail line from Louisville to Dallas or Fort Worth will be asked before February 24, it is announced by Assistant Postmaster General Glover. The Post Office Department expects to open the new route within 60 days

—Colonial Air Lines will erect a $25,000 hangar and workshop as soon as owners of the property in the northwestern area of Brainard Field, Hartford, Conn., put up a "fair price" on the land. The buildings would be used to house emegency planes in addition to those in regular use over the Boston New York run.

—Contracts will be let immediately for lighting, hangar, terminal building, and other improvements at the Evansville Airport, Evansville, Ind. Work on the field is progressing under the direction of B Russell Shaw Co., St Louis airport engineering firm

AIRPORTS AND AIRLINES

Newspaper Has Plane Deliveries

NEW ORLEANS, LA.—Airplane delivery of newspapers has been inaugurated in the South by the *Times-Picayune*, New Orleans daily. Menefee Airways, Inc., is furnishing the plane.

Delivery service will be maintained every Saturday night and will enable residents of the Gulf Coast to procure early editions of the Sunday paper about the same time as they are put on the street in New Orleans. The plane carrying the papers takes off at New Orleans at 8 P. M. and reaches Gulfport in an hour. As soon as landing facilities are ready at other communities along the coast, the service will be extended, the paper announces.

Development Started On Big Akron Airport

AKRON, OHIO.—Development has started on the combined lighter-than-air and heavier-than-air field three and a half miles southeast of the city. The 700 acre tract will include an area of about one-half squire mile for airplane operations, and at one end of the airport will stand the hangars being built for the Goodyear Zeppelin Corp.

It is expected the airport will be completed by about January, 1930. A temporary landing section is being used by Continental Air Lines on the Cleveland-Louisville route. The grading contract is held by Cable Brothers. B. E. Fulton is manager of the airport and Fred E. Swineford, city director of public service, is supervising the construction.

Civil Pilots Debate Records

MINNEAPOLIS, MINN. — Recent claims of Fred W. Kelly, Western Air Express pilot, that he had the greatest number of hours in the air last year in commercial work are challenged by Chadwick Smith chief pilot of Northwest Airways whose log book is said to show 1,173 hr. 15 min. for that period. Kelly's time is put at 1150 hr.

New Beacons at Kansas City

KANSAS CITY, MO.—Steps to aid night flying in the Kansas City district are being taken by the Southwestern Bell Telephone Co. The firm is erecting four beacon lights atop its 28 story building

More Bills Affecting Ports And Airways Introduced

Northern Transcontinental Route Proposed; States Consider Measures

Additional measures affecting aviation have been introduced into Congress and state legislatures recently. In almost every case, the legislation is being championed by men in Congress or legislature who are very close to the aeronautical industry and is assured sympathetic and intelligent backing.

Congress also has been asked to consider a new transcontinental airway extending from New York to Seattle through Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, North Dakota, Montana and Idaho. Representative Allan J. Furlow of Minnesota, sponsor of the bill, would have the airway named in honor of Orville Wright.

The bill would have the secretary of commerce prepare maps of the western section of the proposed route between Minneapolis and St. Paul and Seattle. This would include airport marking, installation of meteorological devices and other aids to air navigation. Mr. Furlow believes the northern route would open up an important artery between the coasts and touch many communities now without direct air connections.

Representative Prall of New York has introduced a bill in Congress to authorize the cession to the city of New York of land on the northerly side of New Dorp Lane in exchange for permission to connect Miller Field, Staten Island, with the city's public sewer system.

Seek Funds for Lowry Field

Maj. Bruce Kistler, commanding officer of the Colorado National Guard observation squadron has asked the state legislature for funds for the maintenance of Lowry Field and other expenses in connection with the aeronautical activities of the state. Major Kistler told the legislators that not more than $10,000 a year is necessary from the state to maintain Lowry Field and that it would cost more to move the present plant than to buy additional acreage. The Federal Government has $300,000 invested in hangars and equipment at the field.

Two measures concerning aviation in Nebraska were approved by the First Nebraska Air Conference at Omaha for presentation to the Nebraska legislature.

The first measure, modeled upon the New York plan, ratifies the Federal Air Commerce Act of 1926, and requires that all planes and pilots engaged in intrastate activities shall have federal licenses. It provides that some state body may be empowered to issue temporary licenses when necessary.

The second measure provides that virtually every city and town in the state shall have the right to vote bonds either

(Continued on next page)

P. A. A. Concern Starts Peru-Equador Service

NEW YORK, N. Y.—Pan American Airways, Inc., the international air transport company already operating three routes from the United States under contract with the U. S. Post Office Dept. to Nassau, to Cuba and to the West Indies and soon to open a fourth route toward South America, via Central America to the Panama Canal Zone, has now inaugurated the first regular air mail and passenger service between Lima, Peru, and Guayaquil capital city of Ecuador, through Peruvian Airways, Inc., an operating subsidiary jointly owned with the W. R. Grace Co., J. T. Trippe president of Pan American Airways, Inc., announces.

From Guayaquil, a line is projected, jointly by Pan American Airways, Inc., and the W. R. Grace Co., northward via Venezuela and Colombia to Cristobal, Panama Canal Zone, where it will link with the Miami-Central America-Panama Air Route which Col. Charles A. Lindbergh will inaugurate on February 4. A fleet of five airliners is in regular service by Peruvian Airways, which has operated with great efficiency since the inception of service.

Newton, Ia., Leases Site

NEWTON, IA.—The Newton Chamber of Commerce has taken a 10-yr. lease on the F. L. Hummel farm east of the city, and will establish an airport there, approval of the site having been given by Harry Larsen, aeronautical engineer of the Airways Division of the department of commerce. The Chamber will finance construction of hangars and other equipment on the field not provided by the Government, which will begin work upon marker and light installation as soon as the weather permits.

Air Service, Inc., Building Hangar

Structure Will Include Service Station; Lean-to Will House Offices

WICHITA, KAN—Air Service, Inc., of Wichita, E. A Watkins president, has started work on a $20,000 combination hangar and service station at the east end of the present municipal airport.

The hangar, 100 by 96 ft., contains an 80 ft. front door clearance 14 ft high which will permit the largest tri-engined plane, now made to be housed. The hangar, of steel construction, will be entirely glassed around the sides.

A lean-to, 16 by 100 ft., will be built on the north side of the building. It will contain offices and locker and dressing rooms. A field service room for storing airplanes also will be contained in the new structure. The hangar and station will be open 24 hr. a day.

Personnel is Listed

Included in the official roster of Air Service, Inc., now operating a flying school here, are A. P. McCullough, director of sales, with a long flying record besides three years of service with General Motors and several years with other large concerns; Norman Warsinske, former head of the Minneapolis school taken over by the new Wichita organization and a well known pilot for many years; G. A. McDonald chief pilot and superintendent of operations, ensign in the U. S. Naval Reserve aviation corps and formerly with the Mohawk Aircraft Corp.; A. L. Yeider, in charge of maintenance, former mail flier; Fred Snavely, ground school instructor, and Eddie Crumplar sales department, with the Canadian Royal Air forces.

Air Service Inc., with schools at Minneapolis and St. Paul, plan to establish other schools over the country during the coming year.

(Continued from page 331)

in a special or regular election and condemn land within or without its limits for an airport. The site must have been approved by the Department of Commerce before purchased.

A bill has been introduced to the Montana legislature which would require pilots to be licensed by the Department of Commerce and forbid the operation of an unlicensed plane. The bill also provides for the acquisition of airports by cities and towns through right of eminent domain and condemnation and financing by bond issue or public funds.

A bill to provide $300,000 for establishing a public terminal aviation field at Governors Island off New York City has been introduced in Congress by Representative La Guardia New York. The measure would repeal all the laws and appropriations heretofore made which would conflict with use of the island as an aviation field.

Missouri Area Craft Numerous

KANSAS CITY, MO—The local chamber of commerce estimates that 23.3 per cent, of the registered airplanes in the United States are within a 350 mi radius of Kansas City.

The figure was arrived at by a study of the airplane registration list issued by the Aeronautics Branch, Department of Commerce. The territory includes virtually all of Missouri, Kansas, Nebraska, Oklahoma, Arkansas, Illinois, and Iowa, and parts of South Dakota, Minnesota, Wisconsin, Tennessee, and Kentucky.

Airport Fee System Developed at Omaha

OMAHA, NEB—A schedule of fees to be charged at the city field was recently fixed at the first meeting of Omaha's new airport commission. A wire, furthermore, was sent to Assistant Secretary of Commerce MacCracken, asking that experts be sent to pass on the availability of the municipal field for commercial and mail flying.

The new fee schedule follows: hangar space for planes with spans up to 35 ft., $25 per month, or $1.50 a day; between 35 and 45 ft. $30 per month, $2 a day; between 45 and 55 ft., $35 per month, $2.50 a day; over 55 ft. $50 per month, or $3 a day. The landing fee will be $1 where service is required.

A minimum fee for flights of $2.50 a passenger was fixed, with the city exacting 10 per cent of the proceeds. Use of the field lights will be $1 for one-half hour, or $2 where use extends to one hour.

Superior Plans Hangar

SUPERIOR, WIS.—The city of Superior will erect an 80 by 80 ft. cement and steel hangar to be used by the Head of the Lakes Airways, of which B. A. Wright is the chief pilot. The structure, specifications for which are in the hands of bidders, will house the offices of the company, rest rooms, machine shop, and storage space for planes. Several planes are expected to be added to handle the increase in activities during the year.

Davenport Gets Projector

DAVENPORT, IA.—A projector of 2,800,000 cp. is being placed on the roof of the American Commercial & Savings Bank here at the base of the beacon erected on that structure. It will be directed southeast toward the Moline Airport, the nearest lighted field. The light will be pointed toward Cram Field, Davenport when that tract is fitted for illumination.

Bids on Mexican Air Mail Line Announced

WASHINGTON, D. C.—Seven bids were received recently in the office of W. Irving Glover, Second Assistant Postmaster General, on the proposal to carry mail by air one way from Brownsville, Tex., to Vera Cruz, Mexico City, or such other points as may be acceptable to the Mexican Government.

Under the proposal the Postmaster General may extend the route via Vera Cruz, Puerto Mexico, and Tuitla Cutierrez to one or more of the countries of Central America, stops to be made at such points in those countries as may be acceptable to their governments.

Names and addresses of the bidders on the bids opened today and the amount of each bid follow:

Pan American Airways, $2.00 per mile. H. S. Adams, Monroe, N. C., $1.50 per mile. Air Transportation, Inc., Minneapolis $0.9875 per mile; Consolidated Aircraft Corp., Buffalo, $1.74 per mile; J. Ray Shute, Jr., Monroe, N. C., $1.15 per mile; Mutual Aircraft Corp., Los Angeles, $1.28 per mile; Walter T. Varney, Inc., San Francisco $1.54 per mile.

It is understood that the air mail route now being operated by the Mexican Government from Mexico City to Nuevo Laredo, Mexico, on the Texas Border, is to be discontinued.

Adopt Wing Insignia For Mail Line Pilots

MINNEAPOLIS, MINN.—An air mail pilots' insignia, designed by Col. L. H. Brittin vice president and general manager of Northwest Airways, Inc., of this city, has been adopted by postal authorities as the official insignia of the United States Air Mail Service. Colonel Brittin announced on his return from Washington.

The badge which will be worn only by pilots in regular air mail service consists of a pair of gold wings outstretched from a disk representing the world, the disk having the words "U. S. Air Mail," superimposed in raised letters.

Authorization to wear the badge will be given only through the Post Office Department, Colonel Brittin said.

Twelve Cities Plan Airports

WASHINGTON, D. C.—The following 12 cities now announce plans for the establishment of municipal airports: Storm Lake, Ia.; Central City, Ky.; Baltimore, Md.; Muskegon, Mich.; Amsterdam, N. Y.; Breckenridge, Tex.; Winters, Tex.; Olympia, Wash.; Ritzville, Wash.; and Moundsville, W. Va.

Bowman Admits Army Fliers

LOUISVILLE, KY.—The Louisville and Jefferson County Air Board has authorized the use of the flying area in Bowman Field the municipal air port in Seneca Park by the United States Army.

Dornier Confers On Lake Service

Builder of Big Flying Boats Talks of Line Which May Use His Planes

DETROIT, MICH.—Directors of the Detroit and Cleveland Navigation Co. and Stout Air Services, Inc., were to hold a joint meeting here Tuesday, as we go to press, with Dr. Claude Dornier, of Friedrichshafen, Germany, to discuss plans for a proposed establishment of flying boat service between Detroit and Cleveland.

Dr. Dornier, builder of the well known Dornier-Wal and Super-Wal flying boats, arrived in New York January 26, where he was met by Alfred V. Verville secretary of the Verville Aircraft Co. of Detroit and personal representative of Dr. Dornier in America.

Following a meeting of the D. and C. directors here on January 25, A. A. Schantz, president of the D. and C. Lines told AVIATION's representative that the company could make no definite announcement as to the proposed service until after the meeting with Dornier and the Stout directors. The general plan, however, he said, was to purchase two Dornier Super-Wal flying boats powered according to reports with Hornet engines and place them in regular service between the two cities early next spring. The service Mr. Schantz said, probably would be operated jointly by the Stout Air Services, Inc. and the D. and C. Lines, the former company handling the operation and technical end with the steamship company handling the business details.

Approved by Stout and Mayo

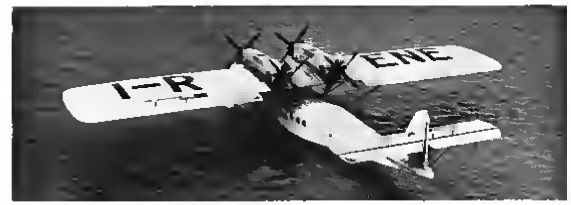
Stanley Knauss, general manager of the Stout company, which company now operates an aerial passenger line between Detroit and Cleveland with Ford tri-engined monoplanes, said his company was first approached on the joint service about a year ago, after Mr. Verville had interested D. and C. directors in the proposition. William B. Stout, president of the company, and William B. Mayo, chief engineer of the Ford Motor Co., and one of the company's largest stockholders, Knauss said, were enthusiastically in agreement with the arrangement.

Colorado Airways Gets Permit

DENVER, COLO.—Permission to carry passengers, freight, and express by airplane between any points in Colorado has just been granted to the Colorado Airways, Inc., by the state public utilities commission.

U. S. Airlines Plans Service

LOUISVILLE, KY.—United States Air Lines, Inc., announces plans for a Louisville - Cincinnati - Columbus - Cleveland - Detroit service.



A Dornier Super Wal Flying Boat

Plans Commuters' Services

NEW YORK, N. Y.—A seaplane commuters' service between Manhattan Island and Sea Gate as well as a service between this city and Coney Island is planned by Coastal Airways, Inc. to begin this spring. Ezio De Angelis, executive chairman of the firm, states that 150 ft. of shore frontage in Gravesend Bay, with two piers for landing passengers, has been leased.

Approves Port Plans Of Milwaukee County

MILWAUKEE, WIS. — A complete plan for the development of the north half of the country airport has been approved by the buildings and grounds committee of the county park commission. It agrees with the present layout of runways and buildings but is a more extensive plan to be followed in future work.

Six runways are provided, two each extending north and south and east and west, forming a square with two diagonal runways connecting the four corners. The average length of the runways is 3,000 ft. The committee is now considering building hard surfaced runways, either of concrete or bituminous surface.

Purchase of a new revolving beacon light and a 75 ft. tower for it, was also approved. Sketches of a building for an electrically operated oil filling station 30 by 44 ft., were also approved and an architect will be employed to make detailed plans for the construction scheduled.

Connecticut Has New Markings

HARTFORD, CONN.—Connecticut has changed its system of identifying State-licensed planes. Previously, in addition to the Department of Commerce numbers painted on the wings, State identification numbers were painted inside a large "C" on both sides of the fuselage. The 1929 markings, however, include only the numerals "29" inside the "C", with the State license numbers recorded on the registration carried in the plane. The Federal numbers now serve as the only identification markings.

Glendale, Calif., Port Will Be T. A. T. Base

GLENDALE, CALIF.—Announcement has been made by Col. Paul Henderson vice-president and general manager of the Transcontinental Air Transport Co. that the Grand Central Air Terminal will be the western terminus of his line. The Grand Central Air Terminal, located at this suburb is the closest airport to downtown Los Angeles that is now available. It is being developed as a base for the operations of the Maddux Air Lines which will soon be flying a total of 15 tri-engined Ford cabin planes over their routes. Since the T. A. T. will also operate Ford planes over its New York-Los Angeles route the choice of this base probably will assure the greatest degree of service on the Ford planes.

In addition to the terminal at Glendale, Colonel Henderson announced that his company has picked an emergency field in the desert to be east of Los Angeles and whenever fog conditions are serious in the Southern California area it is planned to place the passengers on a bus at this desert field and bring them on in by road, a trip of less than 60 mi.

Brick Airport Station Planned for Monroe

MONROE, LA.—A contract was signed recently with the Travis Company of Louisiana for the erection of a brick passenger station and some other facilities at the Selman Airport of Monroe, La.

The building will provide a waiting room for air passengers, rest rooms, and also storage for oil, servicing for airships and quarters for officers of the Delta Air Service Inc. The building is to be tile roofed and of ornate design. It will be the first station of its kind in this part of the state.

Construction will start at once and the station is to be completed for use in 90 days according to officials of the Travis company.

Commercial Sans Accident

KANSAS CITY, MO.—A. A. Yeomans of Commercial Airways, Inc., this city, is "pointing with pride" to the company's record. The firm's three commercial airplanes have now covered a total of 100,000 mi. in a flying time of 1,250 hr. without a single accident.

FOREIGN ACTIVITIES

Will Open First Japanese Commercial Line in April

Wright Whirlwind and Bristol Jupiter Powered Fokker Monoplanes to Be Used

NEW YORK, N. Y.—The Japan Air Transport Co. which was organized in November 1928 with a capitalization of $5 000 000 will inaugurate the first Japanese commercial air mail freight and passenger line in April with a fleet of 'Whirlwind' and Bristol 'Jupiter' powered Fokker monoplanes, Takeo Ohashi, secretary to the president of the company, told a representative of AVIATION in an interview held here late last week.

Mr. Obashi with K. Nishino the president, Maj. H. Abe, former Japanese Army flier and now chief pilot for the concern and H. Shibata, the engine expert, visited New York on the way back to the Orient, following a three months tour of Europe for the purpose of inspecting the airlines there. During the short stay in New York, the group took the opportunity of visiting the plants of Wright Aeronautical Corp., Fokker Aircraft Corp., the Loening Division of Keystone Aircraft Corp., and Fairchild Airplane Manufacturing Corp. A visit was made also to the Newark Metropolitan Airport.

Headquarters in Tokyo

Headquarters of the Japan Air Transport Co. are located in Tokyo. The line to be opened in April will extend from that city to Osaka, the principal industrial center of Japan, and from there to Fukuoka, across the Korea Strait and up to Seoul, Korea, and then on to Dairen, Manchuria at the mouth of the Gulf of Chihli. The total distance of the route is 2 075 km. (approximately 1,300 mi.)

On the Tokyo-Osaka-Fukuoka run, a weekly schedule of six trips each way is to be maintained from the outset, according to Mr. Osashi, while on the route from Fukuoka to Dairen there will be only three trips each way per week until next year, when the schedule will be expanded. A second line from Osaka to Shanghai, China, by way of Fukuoka will be opened next year also, Mr. Ohashi said. On this route a schedule of six trips weekly each way will be maintained with land planes between Osaka and Fukuoka, while the 900 km. (approximately 562 mi.) "hop" across the sea from Fukuoka to Shanghai will be negotiated three times a week each way with large flying boats, probably of European manufacture.

"Our lines will be the first commercial venture in air transportation in Japan," Mr. Ohashi said. "It is true that the Tokyo-Osaka has been operating a line between Tokyo and Osaka but this has been conducted by the newspaper simply as a means of demonstrating the feasibility of airline operation and with the opening of our airline in April, we will take over the service.

"The equipment to start will consist of six Super Universal Fokker monoplanes manufactured by Fokker Aircraft Corporation of America. These planes will be powered with Bristol Jupiter engines. We will also have six Fokker F7 3Ms manufactured by the Fokker organization in Holland. These planes, which are of the three engined type, will be powered with Wright Whirlwind engines of the J 5 series.

"The fares charged on our lines will be approximately the same as those charged by the railways, which ought to make the service extremely popular. The distance from Tokyo to Osaka is 425 km. (approximately 265 mi.), and the fare will be 35 yen, which is approximately $17 in United States currency. The trip by rail requires 13 hr., while by plane it will require only three and one-half hours.

"There is, however, one difficulty. Japan is quite mountainous and the finding of suitable landing fields offers the greatest trouble. At the start we shall probably use the military fields, but in most instances these are some distance from the center of the cities. At Tokyo it takes an hour and one half to get to the field we shall use, and at Osaka it requires an hour to go from the airport to the center of the city. At that, though there is a saving of seven hours over the time of train travel.

Government to Assist

"Our lines will be operated under a $10 000 000 government subsidy, which starts in April and covers a 10 yr. period. In addition, the government is to light the airways and conduct a meteorological service. Speaking of a weather reporting service, in Japan we are not troubled a great deal by fog, but the winds and rain encountered during the month of June offer a problem. There are also bad air currents over the mountains."

Mitsui and Co. and Mitsubishi and Co., two of the leading industrial banking establishments in Japan, are interested in the Japan Air Transport Co., Mr. Ohashi said.

Ferrarin Wins "Best Aviator" Distinction

PARIS, FRANCE—Col. Arturo Ferrarin, personal pilot-in-waiting to Mussolini and co-pilot with Maj. Carol P. Delprete on the record distance flight from Rome to Natal, Brazil, last year, has been declared by the International League of Aviators as "the best aviator in the world in 1928." He was chosen by a margin of but two votes over Capt. Charles Kingsford-Smith, commander of the Southern Cross flight across the Pacific.

Lady Bailey won the trophy for women and Lady Heath was voted a medal. Dr. Hugo Eckener received the lighter than-air trophy while a belated award for 1927 in that field was voted Comdr. Charles E. Rosendahl of the "Los Angeles."

"First Flier" trophies for various countries included: United States, Lieut. Carl Ben Eielson; Australia, Capt. Kingsford-Smith; England, Bert Hinkler; Germany, Capt. Hermann Koehl; France, Lieut. Drumdonne Costes.

Foreign Planes for French

PARIS, FRANCE—It is reported reliably here that the Companie Internationale de Navigation Aerienne, one of the most important of the French airline operators has secured permission from the government air ministry to buy new commercial airplanes of foreign manufacture. The rigid rule that concerns receiving the government subsidy must buy only planes of French manufacture is being qualified in this instance it is said, because the company has been unable to find a French commercial machine meeting its requirements.

Mexicans Plan Line to U. S.

MEXICO CITY, MEXICO—Contracts between the Mexican Aviation Co. and the Mexican Government for operation of an airline between this city and Matamoras near Brownsville, have been signed and it is expected that Colonel Lindbergh will pilot the plane inaugurating the service within a few days. A tri-engined Ford plane will be used. The company is operating at present between this city and Tampico.

Chile Orders Six Vickers

MONTREAL, CANADA—An order for six Vickers Vedette flying boats for summer delivery has been received from the Chilean Government by Canadian Vickers, according to Frank M. Ross, vice president. This is the second order from the Chile Government for Canadian Vickers airplanes.

Breda Develops New Monoplane

Walter Powered Aircraft Has Many Interesting Design Features

MILAN, ITALY—A new type of touring plane was designed and built recently by the Societa Italiana Ernesto Breda. This airplane is a two place, braced monoplane powered with a Walter radial, air cooled engine developing 85 hp. at 1,500 r.p.m. Other power plants also can be used. The plane has folding wing and can be stored in a very small space.

The Breda 15, as the new airplane is designated, has a wing span of 36 ft., an overall length of 22 ft. 2 in. and a gross weight of 1 535 lb. The weight empty is 920 lb. and the useful load is 615 lb. The maximum speed with full load is 112 m.p.h., the cruising speed 87.5 m.p.h. and the landing speed 37.5 m.p.h.

Aileron Positions Changeable

No tools are required in the operation of folding the wings and the total width of the plane with wing folded is 11 ft. 6 in. Dual control is provided and so designed that the two sets of controls can be disconnected easily in flight. An arrangement is provided whereby the position of the ailerons can be changed in landing or taking off without affecting the lateral control. This effect is similar to that produced by wing flaps in changing the camber of the wing and results in a wide range between maximum and minimum speed. Ease and sensitiveness of control are characteristic of this plane, and a device has been installed which makes it possible for the pilot to set his controls in a given position and fly for an indefinite period without taxing his attention to them.

Two doors of ample size are provided to enter and leave the cabin which is 2 ft. 3 in. wide and 4 ft. high and has roof, sides and front of transparent panels with adequate provision for ventilation. The upholstered seats are so designed that parachutes can be carried without discomfort to pilot or passenger. Two suitcases can be stored in the baggage compartment in the rear of the cabin. Complete night flying equipment is furnished, and an indirectly lighted instrument panel containing all the necessary instruments is installed.

A careful study of constructional details has made it possible to incorporate many interchangeable parts in the plane. Wood and steel tubing are used principally in the structure. The wing has a safety of 7. A straight axle type of landing gear is employed.

The specifications are as follows:

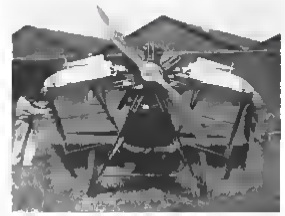
Wing span	36 ft
Total length	22 ft 2 in
Height (from ground)	8 ft 2 in.
Width (with folded wings)	11 ft 6 in.
Weight (empty)	920 lb.
Useful load	615 lb.
Total weight	1535 lb.
Weight per hp.	18 lb.
Weight per sq. ft.	7.15 lb. per sq. ft.
Maximum speed	115 m.p.h.
Minimum (land speed)	37.5 m.p.h.
Cruising speed	87.5 m.p.h.
Climb to 5,000 ft. in	12 min. 12 sec.
Service Ceiling	13,000 ft.
Cruising radius with passenger	8 hr.—900 mi.
Cruising radius with pilot alone	12 hr.—1,000 mi.
Take off (full load)	250-300 ft.
Landing (full load without wheel brakes	150-190 ft.

Pratt & Whitney Will Have Canadian Plant

MONTREAL, CANADA—Pratt & Whitney Wasp and Hornet engines of Canadian manufacture will be available in the Dominion through the establishment of a Canadian branch at Longeuil, near here, to be known as Pratt & Whitney Aircraft Co., Ltd. This plant, to be opened about the middle of this month, will also provide a convenient service department for the large number of engines being used in this country.

The staff at the plant is made up of Canadians who have been thoroughly trained at the company's plant at Hartford, Conn. The officers of the concern are headed by Mr. James Young, formerly vice president and director of the Canadian company of John Bertram & Sons, Ltd. The directors include G. H. Duggan, Ross H. McMaster, H. G. Welsford, G. Montagu Black, Mr. Young and F. B. Rentschler, president of Pratt & Whitney Co. and of the United Aircraft & Transport Co.

Side view of new Breda monoplane with wings in place



Breda monoplane showing wings folded back against the fuselage

Foreign Air Transport Lines Being Developed

LONDON, ENGLAND — New air transport projects in which the empire is interested are as follows:

The French Air Union has announced a new fast service between this city and Paris next summer which is to be called the "The Golden Ray" while the K. L. M. proposes five services daily between here and Amsterdam-Rotterdam.

The Bengal Air Transport, Ltd., has been organized to operate between Calcutta and Assam. This service will be expanded and will be incorporated into the Karachi-Delphi-Calcutta route when that is started. A line will be operated to Chittagong, Bengal, also.

Western Australian Airways will open in April its new service between Perth and Adelaide. The Queensland & Northern Territory Aerial Services (Qantas) of Australia will begin operation April 2 of a line from Brisbane to Charleville in the Interior of Queensland.

A report on the proposed Belgian air line between Belgium and the Belgian Congo has been approved by the cabinet. Negotiations with the governments involved are being carried out now, following decision to fly the direct route by way of France and the Sahara rather than by way of the Nile Valley.

Germans to Make Trade Bid

BERLIN, GERMANY—The airplane industry of this country plans a determined drive for its share of the aircraft market of South America the effort being aimed particularly at French competitors. German interests have secured a strong foundation in that continent through the operation of the Condor Syndicate in Brazil the Aero Lloyd Voliviano in Bolivia and the Scadta in Colombia.

Peruvians to Try New Route

PARA, BRAZIL.—Faced by a lack of adequate landing fields in the northern part of South America on their proposed flight to New York City the Peruvian goodwill fliers have decided to return to their base at Lima, Peru and attempt to reach their destination by way of the west coast of the continent and Panama.

BUYER'S LOG BOOK

Paulin System Altimeter

THE PAULIN System aerial altimeter, which is soon to be produced in quantity by the American Paulin System, Inc., Los Angeles, Calif., is an aneroid instrument embodying a mechanism widely known for its accuracy and dependability. The principle has been used extensively in ground instruments and is now being applied to the Paulin System altimeter. Other instruments embodying this principle will be manufactured by the company as soon as facilities permit.

The Paulin System Altimeter showing setting knob and pointers

In appearance the new altimeter resembles the standard types. A special shock absorbing device built into the case permits mounting without additional cushioning. A manually operated "setting pointer" is provided and may be set by means of a large knob at the center of the dial. A highly sensitive "tendency pointer" indicates at once any departure from a given altitude and makes it possible to fly at any predetermined altitude with accuracy. A zero adjustment makes it possible to obtain a zero setting for any field or barometric pressure. Although the tendency pointer is extremely sensitive, it is so damped that instrument board vibration has practically no effect on it.

In the Paulin system altimeter mechanism, a calibrated steel spring is balanced against the unknown pressure of the atmosphere in a metallic box having a diaphragm to which the spring is connected. Rotating the setting knob changes the tension in the spring. When a balance is obtained the pressure of the air within the evacuated chamber is equal to the tension in the spring. An ingenious arrangement of simple metal bands connects a cradle on the diaphragm with the tendency pointer in such a way that all bearings are eliminated and yet a ratio of 370 to one is obtained between the movements of diaphragm and tendency pointer. The maximum diaphragm movement is limited by stops to .001 in. in either direction and the mechanism is so designed that all readings are made with the diaphragm in normal position. By this design much of the mechanism contributing to hysteresis lag and other errors is eliminated.

As the plane climbs and approaches the desired altitude, the atmospheric pressure decreases until the predetermined altitude is reached. At this point the atmospheric presure just balances the tension of the spring and the diaphragm has moved to the midpoint between the upper and lower steps. The tendency pointer at the same time has moved from plus position to the zero point on the scale.

It is possible by the use of this instrument for the pilot to maintain a given altitude and be informed immediately of any departure from the desired altitude. A number of tests have been conducted with this new instrument and it has been found to be extremely sensitive to changes in altitude of but a few feet. A complete technical description of the Paulin System Altimeter will be published in an early issue of AVIATION.

SIDE SLIPS

By ROBERT R. OSBORN

A correspondent sends in the following news item: "Among the many requests for information received at Oakland Municipal Airport publicity department is one from a firm of airport engineers asking for photographs showing the complete *elimination* of the field at night by the floodlights."

This reminds us of an impromptu airplane race we saw once at an eastern field, in which all of the contesting pilots were somewhat blotto from their celebrating previously, the race being described by a local wag as an "illumination" contest.

* * *

According to the news, a lady has asked the police to look for her son who has disappeared from his home. He is 6 ft. 7 in. tall, weighs 210 lb. and had a great interest in aviation. With this description the police have made a search, so far unsuccessful, of the local flying fields. As a suggestion to the police: If the young man is really trying to keep in hiding, the only possible disguises he could use would be to pose as an air mail beacon or gasoline pump.

* * *

The Intrepid Aviator stopped in the other day to say that he sees where Commander Byrd has sent an order to Seattle for 25 more dogs and he's glad he didn't go with Byrd as he could never stand a diet like that.

* * *

Another news item from California states: "Came Christmas day and the dinner in the home of Horace Lanza of Oakland was about to be served. The doorbell rings and the postman delivers two quarts of ice cream sent from Philadelphia, Pa., via special delivery air mail by Dr. J. R. Harmer. Postage on Dr. Harmer's gift totaled $56.75."

We can imagine the rest of the story. Mrs. Lanza opens and package and says: "Look at that, Horace! Can't they ever get anything right? They sent all vanilla and I ordered mostly chocolate with a little strawberry."

* * *

Shortly another attempt will be made to break the record for automobile straightaway speed, judging by the same old hokum which is appearing in the newspapers again. As an example, here is one of the latest publicity releases: "The stresses and strains on the shafting of an engine going at a speed of 230 or 240 m. p. h., which Major Seagrave hopes to reach, is so enormous that no other known metal in the world would stand the friction without getting overheated and melting. The same applies to the radiators, in which we believe we have solved the cooling problem. They contain between 7 and 10 lb. of tin."

When the newspaper correspondents covering last year's record breaking attempts wrote that the cars flashed by so fast as to be almost invisible to the human eye, we speared that hokum forthwith and nailed the hide to the door of our cabin. Also, we offered the services of a pair of first class human eyes to cover other events of that type in the future, as we had experienced no difficulty seeing airplanes which were making 300 m.p.h. when they passed within 50 or 60 ft. of us. So, as insurance against columns and columns of the same bunk in connection with this attempt our offer is renewed.

"Air builders... of what do you build?"

Only the most modern, scientific finishes can master the sky

FINISHING materials adequate for my lady's dressing table are not built to stand the gaff of the air. An aeroplane is built of special materials. It must undergo conditions of wear—sudden changes in temperature, stresses and strains from which even the most severely-used automobile or locomotive is immune.

Today du Pont offers makers of aircraft, finishes that are new, unique—the ultimate achievement of modern chemistry. Du Pont Wing Dopes and other special products are built to protect and beautify every surface of your ships against the worst that heat, cold, sun and weather can do—long after other materials have suffered the fate of all unfit things.

Every du Pont aircraft finish has been tested—both in laboratory and in the most gruelling flying service.

Now—Utilize Style and Color to the Full

Du Pont brought color to the motor-car and the home. Now you can take advantage of this additional asset—the powerful modern selling appeal of style. Du Pont shades and tints are authoritative. They have been studied by optical experts and meet your special requirements of visibility.

Say "du Pont finishes" to your prospect and that part of your selling job is done.

The stylists of du Pont Color Advisory Service are in constant touch with trends in the aviation field, both in America and Europe. They will be glad to suggest harmonies specially suited to the air. In solving your finishing problems, call on them as well as on the du Pont technical experts.

Du Pont Paints and Varnishes. Du Pont chemists have developed a complete line of paints and varnishes including Dope-proof Paint, water resistant Spar Varnish and engine finishes.

Du Pont Wing Dope. The du Pont line of nitrate dopes includes several tested formulas remarkable for build and durability. Impermeable, airproof, hard yet flexible, remarkably resistant to violet rays. Available in a wide variety of highly visible colors.

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THE proudest buildings in massive stone are puny beside today's skyscrapers with their thin shells of steel and concrete. New purposes evolve new means of accomplishment.

Imaginative aircraft manufacturers today realize that du Pont Pyralin and Fabrikoid are materials pre-eminently theirs—substances that are by their very nature "air-destined."

Very light, durable, resistant to the severest air conditions, in their separate fields these two du Pont products are inevitably taking the place of older substances which tradition has brought up from the ground.

Let us send you data as applied to your specific problem

If you don't use 100% transparent Pyralin for your cabin windows, instrument boards and wing lights, for example, you will be interested in knowing more about it. This remarkable material in various colors and effects also has unlimited decorative quality.

Fabrikoid for upholstery brings to cockpit or cabin a beautiful covering with lasting qualities no old type fabric can approach. The designs of the new light-weight Nemoursa Aeroplane Fabrics for cabin ships portray the buoyancy, luxury and gay spirit of the modern mode of travel.

Du Pont technical men have wide experience in the field and are always ready to co-operate with you wholeheartedly on your problems. Please write to the division concerned.

AIR-TESTED MATERIALS

Fabrikoid. Sturdy Fabrikoid is an ideal material for open cockpit upholstery. Will withstand all weather conditions. Nemoursa Aeroplane Fabrics are new type, light weight materials developed for interior trims of cabin ships. Made on a high grade woven cotton base and treated with appropriate pyroxylin colors. Embossed in distinctive patterns.

Du Pont Pyralin. A strong, durable, light, unbreakable, transparent material furnished in any gauge from 5/1000 upward in sheets approximately 20 in. x 50 in. Ideal for windshields, cabin windows, running lights and other uses.

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THANK YOU *for mentioning* AVIATION

WINNER OF INTERNATIONAL LIGHT AIRPLANE MEET

AKL25 WATER TYPE

AKL25 LAND TYPE

The Aeromarine Klemm—AKL25 plane, known in Europe as the Klemm monoplane, was adjudged the most efficient general-purpose airplane of its type, in the recent International Light Airplane Meet held at Orly Aerodrome, Paris. Of the numerous light planes entered in the meet, only seven survived the rigid tests.

The efficiency of the competing planes was determined by multiplying the useful load carried by the speed in miles-per-hour, over a hundred and ninety-five mile course, and dividing the result by the total fuel consumption in pounds.

The trials which gave the AKL25 the highest total number of points scored by any plane, was based not alone on efficiency of operation, but included the consideration of such qualities as comfort — protection against turning over—time required to start engine —dual control—anti-fire protection—speed of dismantling and assembling plane—take off from muddy field and climb.

The result of this contest singularizes the Aeromarine Klemm—AKL25 — as the international winner—the proven light plane for pleasure and profit — particularly adaptable for owner-pilot operation and flying instruction.

For the complete story of the AKL25—*the wonder-plane of two continents*, write the

AEROMARINE KLEMM CORPORATION

PARAMOUNT BLDG. 44TH ST. & B'WAY. NEW YORK.

AERO MARINE

Above: Nickel Alloy Steel cam ring used in Warner "Scarab" engine. *Mfd. by* THE WARNER AIRCRAFT CORP., *Detroit, Mich.*
At left: Nickel Alloy Steel crankshaft of Warner "Scarab" airplane engine.

All highly stressed parts of

WARNER "SCARAB" ENGINES

are Nickel Alloy Steel

IN the New York to Los Angeles, Class A, Air Derby, planes equipped with Warner Scarab engines won first, second, third and fourth places. In the Cincinnati Class A Derby, Scarab-powered planes won first, second and third places. These outstanding records are positive proof of the remarkable performance and the excellence of design of these powerful, low-weight, Scarab engines.

The Warner Aircraft Corporation uses Nickel Alloy Steel for more than fourteen parts in the Scarab airplane engine. From crankshaft to bolts—wherever dependable strength must be secured without excessive weight—Nickel Alloy Steels are employed. In adopting Nickel Alloy Steel for Scarab parts, the designers have taken advantage of the uniformity of physical properties which characterize this type of alloy steel.

Nickel FOR ALLOY STEEL

The widespread use of Nickel Alloy Steel parts by leading manufacturers of airplane engines is conclusive proof of the dependability of these alloys. The experience of typical users has contributed to an extensive fund of valuable technical data. You are invited to consult our engineers and to draw upon this helpful information at any time.

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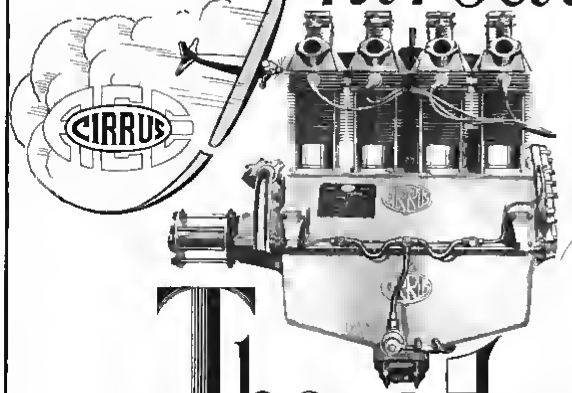

The World's most famous four cylinder in line air cooled engine, holder of many international records.

The American Cirrus Mark III

IN PRODUCTION APRIL, 1929

So simple in design that it requires no greater skill for its maintenance than an ordinary automobile engine.

Built of the finest materials and so sturdily constructed as to outlive many engines in its power class.

So perfect in workmanship that it can well be compared to a high-grade watch.

So reliable and astounding in performance as to warrant the statement that this engine made the light aeroplane of today possible.

Mounted in the nose of any light sport or commercial aircraft, it increases speed by reducing head resistance without obstructing forward visibility.

THESE ARE THE CHARACTERISTICS OF THE CIRRUS ENGINE, NOW BUILT AT OUR NEW PLANT IN BELLEVILLE, N. J.

Streamline cowling Avro-Avian

Write today for specifications and further literature

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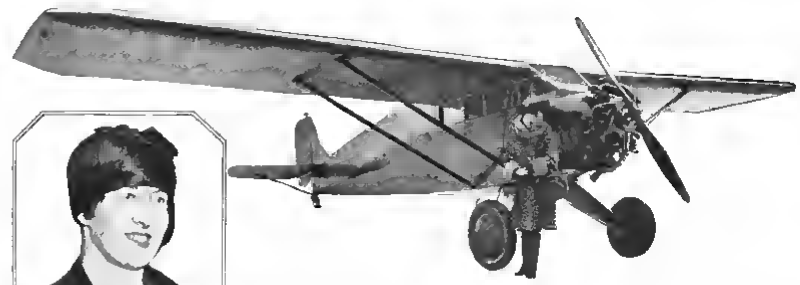


Lady Mary Heath

England's "Lady Lindy" Praises The Aristocrat, America's Finest Small Plane

The Aristocrat

All That the Name Implies

Many famous flyers say that the Aristocrat Three-Place Cabin Plane is the last word in safety, performance and ease of handling.

Elegant in appearance and comfortable in the coldest weather, it is the ideal all-purpose plane for all seasons.

Make us prove it to you!

A Complete Line

General Airplanes Corporation manufactures a complete line of commercial airplanes of advanced design, all conforming to the specifications of U. S. Army, Navy, and Department of Commerce, as well as the I. C. A. N.

HOTEL STATLER
BUFFALO

December 15,1928.

Mr. G.MacLean Gardner,
General Airplanes Corporation,
Buffalo, New York.

Dear Mr.MacLean Gardner:

I want you to be kind enough to convey to your company my gratitude for the loan of the "Aristocrat" for me to fly it to Toronto and back yesterday.

I am glad to see that you are filling the crying need for a really comfortable salon-car-like interior. It brings one to the end of even such a snow storm journey as we had yesterday, fresh and untired.

I was particularly impressed in flying the Aristocrat--my first small cabin plane--to find the ease of handling and good balance of the controls. You have succeeded in giving a very good range of visibility. I was amazed at its load carrying capacity--three people and all their kit. Its low landing speed, and its lateral control at low speed.

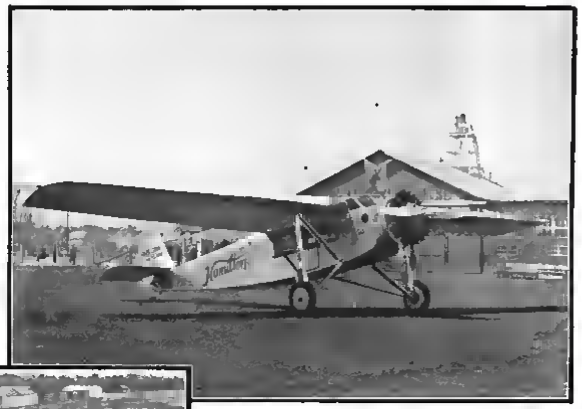
When I come to Buffalo again I hope you can see your way to permitting me to borrow it again.

Sincerely yours,
Mary Heath

Dealers: *Perhaps your territory is still open. Wire or Write for our Attractive Offer.*

GENERAL AIRPLANES CORPORATION, *552 Abbott Road, Buffalo, N. Y.*

from Alaska *to the* Tropics
Over Land and Sea



JUST as the coming of the airplane marked a new era in methods of travel . . . so does the Hamilton Metalplane mark a new era in aircraft development. *From Alaska to the Tropics*, they have proven their supremacy . . . Over land and sea . . through night and day they have faithfully and safely carried their cargoes of passengers and mail. In the far off Arctic a Hamilton Metalplane may be chartered for trips to Siberia . . . In the steaming Tropics a Hamilton Metalplane carries gold to laborers far in the interior . . . While at home—fleets of Hamilton Metalplanes maintain definite schedules between some of our great cities. They were chosen for air-rail hook-ups.

The brilliant performance records of Hamilton Metalplanes know no bounds of time or place. They have brought new comfort . . . new speed . . . new safety . . new economy . . and reliability in the field of commercial flying.

HAMILTON METALPLANE COMPANY, 530 PARK ST., MILWAUKEE, WIS.

THANK YOU *for mentioning* AVIATION

Hamilton Metalplanes Have Proven their Supremacy . . .

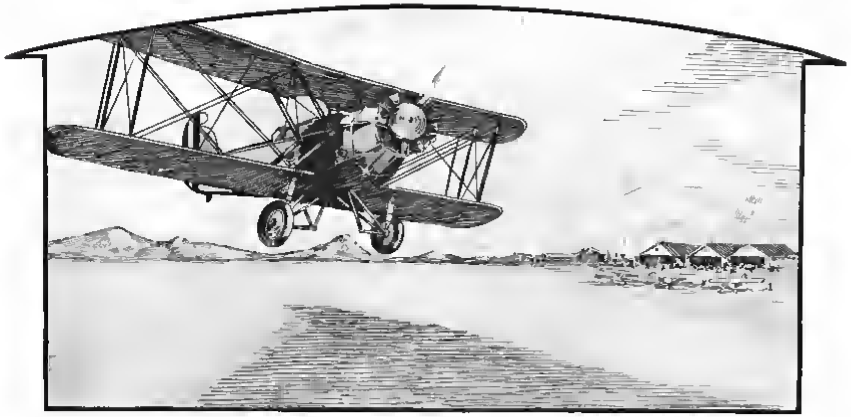
THE Hamilton Metalplane is constructed entirely of metal (alclad non-corrosive duralumin) . . . not because of fancy or popular prejudice . . . but because metal has proven its superiority in every respect over other materials . . . because it can be machined with scientific accuracy and its margins of safety can be definitely calculated . . . because it is fire-resisting . . . weatherproof and resists deterioration.

In every detail of its conception, the Hamilton Metalplane is destined to maintain its established leadership. In appointments and luxury, it compares with the modern limousine. . . . Its great enclosed cabin delights the traveler with its comfort and quiet. The Hamilton Metalplane has unusual speed and power . . . it is quick and easy to handle . . steady and sure in the open sky ways.

Let us send you full information on this remarkable plane . . . or see it at the New York show. . . Let us tell you in detail of the achievements of this transport of tomorrow.

Hamilton

THANK YOU *for mentioning* AVIATION

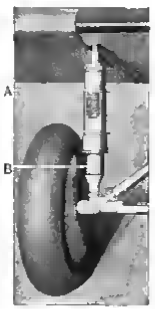


AEROL STRUTS HAVE CONTRIBUTED TO MARTIN ACHIEVEMENT——

MANY factors enter into the remarkable performance of the Martin "74." No small portion of its far-famed ability in taking-off and landing is attributed to its being equipped with Aerol Oleo-Pneumatic Struts.

Capable of absorbing, without recoil, a landing impact equal to several times the weight of the loaded plane, these struts not only protect the ship from destructive shock but make practical the carrying of maximum pay loads.

The unequaled smoothness of taxiing, and firm yet resilient action of Aerol Struts, enable the Martin "74" to take-off under full load with astonishing ease.



This view shows how Aerol Struts are installed between the fuselage and wheels. A is the stationary cylinder. B is the sliding piston attached to the axle allowing perfect freedom of movement yet effectively eliminating destructive shock before it reaches the fuselage.

Last but not least is the factor of landing-safety that is contributed by Aerol Struts. Ask any pilot, who has made a forced landing, how good it is to realize that a pair of Aerol Struts are between him and the ground.

The Great Lakes Aircraft Corp'n, makers of the Martin "74," now standardizing on this equipment, are offering the industry the utmost in protection to ship and structural maintenance.

Aerol Struts are produced by The Cleveland Pneumatic Tool Company, Cleveland, Ohio.

Also manufacturers of Cleco-Gruss and Cleco-Westinghouse Air Springs for buses, trucks and automobiles

Ask the Pilots Who Land On Them

AEROL *shock absorbing* STRUT

MORE passengers, more mail and more merchandise will be carried by air transport this year than ever before. The increased traffic will necessitate the expansion and extension of existing transport services, and will furnish profitable markets for new lines.

THE COMMODORE

CONSOLIDATED AIRCRAFT

To make more economical the present operation of air transport and to promote a more far-reaching public confidence . . . increased pay loads must be carried, greater distances covered, and schedules maintained more regularly—with unprecedented dependability and safety.

The Commodore—a new and distinct type of flying cabin cruiser—meets these growing demands of commercial aviation, particularly over water.

In design and construction, The Commodore is the same as the highly efficient Consolidated Navy Patrol Plane XPY-1, except that the hull shape of The Commodore above the water line has been modified to accommodate comfortably thirty-two passengers, in addition to baggage, toilet and radio compartments. Three Pratt and Whitney Wasp engines provide the motive power, producing a high speed of one hundred and thirty miles an hour and a cruising speed well over one hundred miles an hour.

To established transport operators, individuals or organizations contemplating air transport service, we will be glad to furnish facts and figures . . . a detailed survey showing how The Commodore can comply with any particular phase of transport work.

Consolidated Aircraft Corporation, Buffalo, N. Y.

For Profitable Flying Service
The Curtiss Robin

Developed from Curtiss' twenty years of aircraft engineering and production experience . . . built to Curtiss quality standards . . . proved in service at Curtiss Flying Fields, the Robin is a profitable plane for flying service operators.

An inspection, or better still, a demonstration will convince you that the Robin has unusual stability, performance and durability. We shall be glad to send you complete information and the name of the nearest Curtiss Robin representative. Shall we?

CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY, LONG ISLAND, NEW YORK

Sole Sales Agents in United States

Manufactured by Curtiss-Robertson Airplane Mfg. Co., Anglum, St. Louis County, Missouri

Install the "Challenger" Engine in *Your* Ship—

Travel Air 3-place Open Cockpit Plane with Curtiss "Challenger" installed.

Robin 3 place Cabin Monoplane with Curtiss "Challenger" installed

Fledgling, Open Cockpit Training Type with Curtiss "Challenger" installed

Fairchild 5 place Cabin Monoplane with Curtiss "Challenger" installed

It Gives You:

Smoothness: The "Challenger's" unique arrangement of six cylinders on a two-throw crankshaft provides more perfect dynamic balance than is obtainable with any single row radial type of engine. For this reason the "Challenger" is exceptionally smooth in operation.

Reliability: One-two-three 50 hour runs on the block, plus hundreds of hours of flight-testing in the air—have established the unfailingly reliability of the "Challenger" engine, a fact attested everyday by "Challengers" in actual service.

Economy: Casey Jones on a recent 6000 miles transcontinental flight with a Curtiss "Challenger" averaged 11½ miles to the gallon of gas, without any expense for replacement or repairs.

And—

Curtiss Engineering Cooperation

With every "Challenger" goes the assistance of the Curtiss Engineering staff in designing your installation so that the "Challenger" may bring to *your* ship 100% of its known smoothness, reliability and economy.

The "Challenger" is the product of the same engineers who have produced engines for the U. S. Army & Navy planes with noteworthy success. Now the "Challenger" affords the same kind of performance in commercial use.

Eight representatives manufacturers have already purchased "Challengers" for immediate installation in their aircraft. If you want a "Challenger" for the coming season, better place your order now.

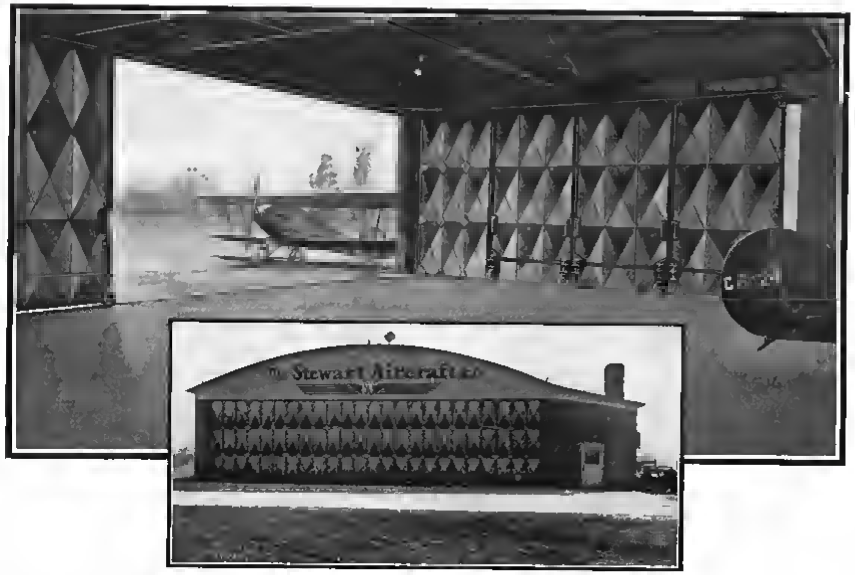
CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY, LONG ISLAND, NEW YORK

Sole Sales Agents in United States

Manufactured by Curtiss Aeroplane and Motor Co., Inc., Garden City, N. Y. Factories: Garden City and Buffalo, N.Y.



There's an R-W Way for *every* doorway

The hangar of the Stewart Aircraft Company at the Cleveland Municipal Airport has a storage capacity of 10 planes. The doorway of the hangar is 56 ft wide by 13 ft. 9 in. high.

When Richards-Wilcox engineers were called in to solve the doorway problem for this large opening, they installed 8 all-steel doors They operate on curved floor rails which permit the doors to slide back to either side, allowing a full width unobstructed opening without center posts.

The top of the doors are guided by ball-bearing rollers between two channel irons. The whole weight of the doors—approximately 3 tons—is carried on R-W ball-bearing rollers running on floor rails firmly imbedded in concrete. The ball-bearing rollers give perfect balance to the doors and make one-man operation easy.

The Richards-Wilcox all-metal construction assures a door that will not warp or swell because of rain, snow, and freezing weather.

Richards-Wilcox all-metal doors and door hardware are not just so much hardware and material. Behind every installation are Richards-Wilcox engineers, who design doorway equipment to function efficiently, economically, and without trouble.

If you have a doorway problem an R-W doorway engineer will be glad to talk it over with you. There's an R-W Way.

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides"

AURORA, ILLINOIS, U.S.A.

New York . . . Chicago

Boston Philadelphia Cleveland Cincinnati Indianapolis St. Louis New Orleans Des Moines Minneapolis Kansas City Los Angeles San Francisco Omaha Seattle Detroit

Montreal RICHARDS-WILCOX CANADIAN CO., LTD. LONDON ONT. Winnipeg

"THE · BEST · LIGHT · AIRPLANE · IN · THE · WORLD"

Guaranteed Performance
of Standard Moth Landplane

Top Speed	103-105 M. P. H.
Cruising Speed	85-90 M. P. H.
Stalling Speed	41 M. P. H.
Rate of Climb	700 feet min.
Ceiling	18,000 feet

Announcing American Production

The D. H. GIPSY MOTH

THE D. H GIPSY MOTH—"the light car of the air"—brings to American aviation a new and unique type of airplane which has achieved such remarkable popularity that it is now flown in every country in the civilized world.

It holds the important world's light airplane records for speed, altitude, and endurance, yet it is so safe, so easy to learn and handle, that it is the ideal plane for beginners and women flyers. It is as economical to run as an automobile and, because of its lightness and folding wings, it can be towed over an ordinary road and stored in a fair-sized garage.

The Moth plane and engine were designed by Captain de Havilland, acknowledged one of the world's greatest aeronautical engineers. The de Havilland Gipsy Engine will be built by the Wright Aeronautical Corporation in the United States.

Exceptional Moth features include welded steel fuselage, combining unusual strength and lightness; *folding wings*, which permit passing through a 10-foot gateway; and the famous Handley-Page safety slotted wing (furnished as an extra), which aviation authorities agree is the greatest single contribution to safety in flying. The Moth is now the *only* American plane with slotted wings.

In 4,000,000 miles of flying the Moth has an unequalled record for safety.

Deliveries of American-built Gipsy Moth planes will soon be available. Send for booklet and complete details.

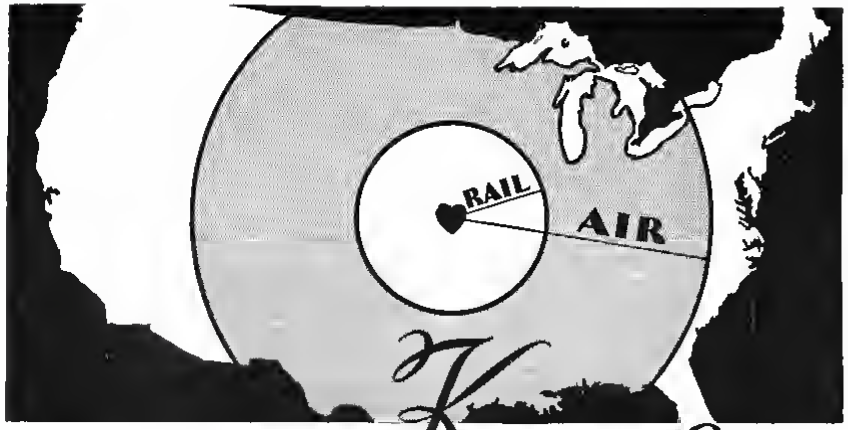
To Prospective Moth Owners—We suggest ordering *now*, as we expect our early production to be greatly oversold.

To Dealers—We are now ready to extend the Gipsy Moth franchise to responsible dealers, whose inquiries are solicited.

LICENSEE: THE DE HAVILLAND AIRCRAFT CO., LTD

MOTH AIRCRAFT CORPORATION

GRAYBAR BUILDING, NEW YORK · · · FACTORY, LOWELL, MASS.



KANSAS CITY—
The Hub of Air Transport

At the center of the air transport system of America—*today is an air age*—areas reached by previously known forms of transportation become dwarfed by the speed of air travel—nine hours by air from Kansas City reaches 2½ million square miles as compared to less than 300,000 square miles by rail, *an increase of more than* 900%—a rich market where the airplane finds its greatest utility in operating over the vast plains of the Middle West—*Kansas City—the hub of air transport.*

Chamber of Commerce of

KANSAS CITY

Kansas City, Mo.

Not just a city but an empire

Kansas City advertising does not confine itself to corporate limits. Within the territory are raw materials and manufacturing advantages of a highly diversified nature . . . many within the city itself many in the smaller cities of this rich area. Kansas City undertakes to tell the story of the *entire territory* to interested manufacturers realizing that the city prospers only as its outlying territory prospers.

Opportunity Here Awaits These Products

Men's and Women's Clothing • Aircraft and Accessories • Hosiery • Dairy Machinery • Steam Fitting and Heating Apparatus • Furniture • Porcelain Ware Perfumery and Cosmetics • Millinery • Wallboard • Insulated Wire and Cable • Moulding of Bakelite • Radio Equipment

Literature will be sent only when this coupon is attached to your business letterhead. If not desirous of revealing identity at present, it is suggested that your banker or lawyer may obtain the book for you.

Industrial Committee, Room 25
Chamber of Commerce, Kansas City, Mo.
Please send me, without obligation, "The Book of Kansas City Facts"

Name _____ Business Title _____
Address _____ Nature of Business _____
City _____ State _____

U.S. Direct Drive ¼ inch Drill
10,000 RPM under full load
(4 lbs.) **$25**

IF *your* drill requirements are stiff, specify the drills proven to have the edge for such service. Ever since the world's first portable electric drills were brought out by U. S. over thirty years ago, they have had this reputation. They have introduced practically all the worth while features for maintaining full rated speed under continuous heavy load, for light weight and long life: Powerful universal motor for A. C. or D. C. Chrome nickel steel gears, hardened, running in grease. SKF Ball Bearings. Double silk insulated, enameled armature wire. Three-jaw screw back chuck. Quick make, quick break, two-pole trigger switch. One-piece cylindrical aluminum frame and commutator head, etc. There's a full line for all aviation requirements. Got our catalog?

Ask Your Jobber or Write Us

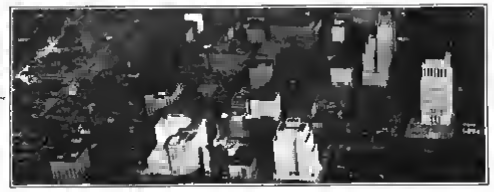
The UNITED STATES ELECTRICAL TOOL COMPANY
2466 W. SIXTH ST. CINCINNATI, U.S.A.

THE STANDARD OF QUALITY SINCE 1897

Oldest Builders of Electric Drills and Grinders in the world

Export Sales Representatives: Westinghouse Electric International Co. 150 Broadway, New York City

You *must not* learn less than enough!



Only 15 minutes by motor from Parks Airport to the downtown district of St. Louis

UPON the thoroughness of your training as a flyer depends not only your future in aviation, but your life itself. Listen, then, to this—

ANNOUNCEMENT

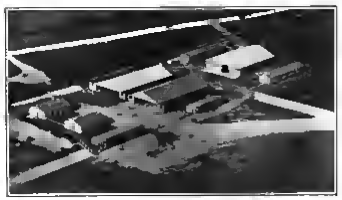
BY AMERICA'S LARGEST COMMERCIAL AIR SCHOOL

A NEW standard inevitably to be accepted by every honest, progressive flying school.

Hereafter, Parks Air College will graduate no student without training sufficient to fit him for qualification for a Department of Commerce Pilot's License

From February 15, 1929, our Private Pilot's Course insures every student 20 hours of supervised flying instruction so that at its close he has not only the foundation for a safe and successful flying career, but has spent enough time in the air to take the Department of Commerce examination for a Private Pilot's License

As heretofore, our Advanced Pilot's Course guarantees our students the 50 hours' flying time necessary for examination for a Department of Commerce License as a Limited Commercial Pilot with the right to carry passengers in airplanes licensed by the United States



BREADTH OF TRAINING

must be yours if you seriously contemplate a career in the fascinating and profitable business of flying, just as it must be yours for your own safety if you intend to take up flying as a sport

See then, the features that make Parks Air College the finest and most completely equipped flying school in the United States—that have made it the **largest** Commercial Flying School in the country

New production airplanes used exclusively—a fleet of 20 ships

Only experienced and Licensed Transport Pilots employed as instructors—12 of them to serve you

Airplane, engine and navigation experts to teach you in the class room—the finest instructors that could be obtained from the ranks of the Army, Navy and University Staffs

Complete shop equipment including Whirlwind, Caminez Hispano-Suiza, Velie OX-5, and other modern power plants

Dormitories, cafe and recreation room for students ample housing facilities for those who want to live away from the field, modern class rooms and shops—a plant that cost more than $200 000—a flying field that is a favorite stop for cross-country pilots Only 15 minutes by motor from Parks Airport to the downtown district of St. Louis

IF YOU INVESTIGATE—

it's a foregone conclusion that you will decide to come to Parks Air College. You can't afford to do anything else. Remember, too that despite its pre-eminence, Parks Air College training costs no more than training in an ordinary school.

If you want further information before making your decision, let us give it to you. Write for "Skyward Ho!" a fascinating, illustrated book describing Parks Air College and giving the reasons for its leadership Here's the coupon, just below Sign it and get it off in the next mail.

AND INCIDENTALLY—

when you receive the catalog, pay particular attention to our promise of a job in the Parks organization to students who obtain their Limited Commercial Licenses IT'S AN OPPORTUNITY WITHOUT PARALLEL IN AVIATION

PARKS Air COLLEGE inc

204-M Misaouri Theatre Bldg., St. Louis, Mo.

PARKS AIR COLLEGE, Inc.,
204-M Missouri Theatre Bldg,
St Louis Mo

Send me "Skyward Ho!" please, with full details of your courses

NAME .....

ADDRESS .....

CHILEAN GOVERNMENT *commends* BLAW-KNOX *for rapid and satisfactory erection of* HANGARS

In the letter at left (freely translated), Senor Flores presents his compliments and extends congratulations to the BLAW-KNOX COMPANY for the rapidity and perfection of performance in erection of HANGARS for his government, which were completed well ahead of contract date.

The three HANGARS shown above furnished by the Blaw-Knox Company to the Chilean Government are 60′ x 60′ x 14′. Note the trim, clean-cut design and large (glass) lighting area on three sides. These HANGARS provide for present needs and can be easily enlarged to meet greater requirements simply by adding new standard parts. Like other Blaw-Knox Galvanized Standard Steel Buildings, HANGARS are shipped to all parts of the world and are successfully erected by unskilled labor with minimum supervision. They meet all demands for WEATHERTIGHT, FIRESAFE housing for aircraft. Ask our nearest district office to quote you on HANGARS of any size to meet your specifications.

BLAW-KNOX COMPANY
647 Farmers Bank Bldg, Pittsburgh, Pa.
New York Chicago Birmingham Philadelphia Cleveland, Detroit Buffalo Baltimore.

BLAW-KNOX

1929 NATIONAL BALLOON RACES

(Under auspices, National Aeronautic Association)

UNIVERSITY of PITTSBURGH STADIUM

May 4th, 1929

PITTSBURGH AERONAUTICAL EXPOSITION

PITT STADIUM ESPLANADE

May 2, 3 and 4

(175,000 people attended 1928 National Balloon Races in Pittsburgh)

WRITE FOR SPACE RESERVATIONS AND RATES

AERONAUTIC CORPORATION OF PITTSBURGH

Suite 106 Wm. Penn Hotel
Pittsburgh, Pa.

MILL BASIN inc. AIRCRAFT

ANNOUNCING

the

Super-Gull

A NEW all wood flying boat powered with a Wright J-5-A motor and shown for the first time at the New York Aviation Show, Booth A-3, February 6th to the 13th.

Mill Basin Aircraft, Inc.

Mill Basin Brooklyn, N. Y.

KINNEAR HANGAR DOORS

Cost . . . Future

THE price of an article is what might be called first cost. The cost of an article is the price plus the upkeep. It is the cost that everyone is interested in. All industries that are successful have learned by hard experience how to keep costs down, that is why they are successful.

It is estimated that American cities have spent more than a billion dollars in the last five years for improvements that would not have been necessary had more vision been employed in the planning. This money was spent for widening of streets, increasing sizes of sewers, making new boulevards, extending transportation systems, and other needed civic improvements.

Now comes the problem of the Airport. The Department of Commerce wants every municipality to have an Airport. Are the cities and small municipalities planning ahead, to the future, that future which takes in Air Transportation and its endless possibilities?

The experimental stage is past and those cities that want air transportation will have to provide adequate facilities and suitable buildings for aircraft. Better buildings will have to be built, and for better buildings, we are building Kinnear Hangar Doors.

Our doors are the result of years of experience in manufacturing. They are built to meet all aviation requirements and our engineering staff is at your disposal. We would like the opportunity of going into details with you.

The Kinnear Manufacturing Co.
MAKERS OF KINNEAR AUTOMATIC FIRE DOORS
General Offices:
5 Fields Ave. Columbus, Ohio

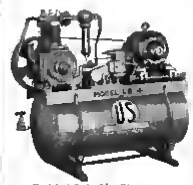
District Offices in

BOSTON, 294 Washington St.
CHICAGO, 120 N. Wells St.
CINCINNATI, 528 Walnut St.
DETROIT, 612 Ford Bldg.
NEW ORLEANS, 730 Hibernia Bk. Bldg.
NEW YORK, 342 Madison Ave.
PHILADELPHIA, 303 Wesley Bldg.
PITTSBURGH, 617 Oliver Bldg.
KANSAS CITY, MO., 311 Railway Exchange
WASHINGTON, D. C., 1135 Investment Bldg.

KINNEAR ROLLING DOORS

U. S. Equipment for the Servicing of Aircraft

A dependable, economical source of compressed air is a necessity in the modern hangar. The United States Air Compressor Company has developed special combination units with sufficient capacity for spraying dope and various finishes, cleaning engines and operating blow guns as well as tire inflation.



Model LC-4 Air Compressor

Air Compressors

The Model LB-4 is a heavy duty, air cooled, two-stage compressor especially suitable for the large hangar requiring a considerable volume of air for cleaning engines, spraying dopes and finishes, spray painting, and operating bench nozzle as well as inflating tires.

Portable direct inflation air compressor

Portable Compressor

Model SA-14X is a portable, direct inflation air compressor designed for tire inflation only. It can be operated from any electric light line. Being light and portable it can be used for inflating tires of ships on the runway or any place in the hangar.

U. S. Engine Cleaner

Cleaning Motors

The U. S. Engine Cleaner is an ideal appliance for cleaning motors with either kerosene or air. A valve, controlled at the nozzle gives either a spray of oil or dry air for cleaning in inaccessible places. These engines greatly aid the mechanics in better engine inspection. Every hangar should have at least one U. S. Cleaning gun to maintain a proper standard of efficiency and safety.

U. S. Electro Hy-Press Greaser

High Pressure Greasing

The U. S. Electro Hy-Press Greaser is a fast and sure unit for the high pressure lubrication of all parts of a ship equipped with Alemite or Zerk fittings. Is portable, fully self-contained and operates from any electric light line. Licensed by Alemite.

U.S. AIR COMPRESSOR COMPANY

5348 Harvard Ave. Cleveland, Ohio

Not Records . . . But Every Day Performance

Although Hamilton Propellers hold many records, their position in the industry is due to everyday performance. Hamilton "Props" are built to combine the utmost in efficiency and service. They are scientifically designed and manufactured.

Naturally, with such standards as these, Hamilton Propellers have many achievements . . and they will no doubt have as many more in the future . . for the preference for Hamilton Propellers is overwhelming.

HAMILTON AERO MFG. COMPANY
Milwaukee, Wis.

TRADE HAMILTON MARK
PROPELLERS

Sanctioned by Aeronautical Chamber of Commerce

You'll Profit by Exhibiting at the

BUFFALO AVIATION SHOW

MARCH 23rd to 30th, Inclusive

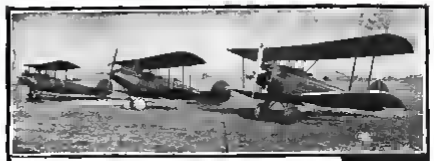
Buffalo—Your Market—"4 Air Hours"
From Three-Fourths of the Population
of the United States and Canada

ALL EXPENSE TO EXHIBITOR REDUCED TO ABSOLUTE MINIMUM

Write, Wire, or Phone for Complete Information

BUFFALO AVIATION SHOW, *303B Mutual Bldg., Buffalo, N. Y.*

Telephone, Seneca 7749



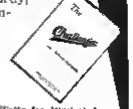
Challenger!

Comet—OX5—Warner

TAKE your peek—step into the comfortably upholstered, roomy cockpit. Notice the complete instrument equipment and how conveniently they're placed. See how the controls respond to the slightest touch.

Give her just a short run, then up and away. Watch how swiftly and steadily she climbs—how quickly she obeys. Loop her and roll her—get all the fun that flying provides. Then put her down slowly—surely into the smallest field.

Trim of line—graceful as a bird—easily controlled—strong, sturdy, safe—the ship of ships for commerce or sport—Challenger!



Write for illustrated booklet telling all about the Challenger.

This is one of the most popular blow torches we have ever made. It is more expensive than the 158 because it is made for much harder use. It is designed for the man who uses a blow-torch in his daily business and demands not only excellent performance but rugged ability to stand rough handling. 32 contains the most advanced patented C & L blow torch improvements. It has a red handle with the gold stripe. Sure sign of satisfaction.

Are You Particular About Your Tools?

"You bet your life I am," you say. "When I buy a tool it's got to be right and *it's got to stay right.*"

When you buy a Clayton & Lambert torch you're putting a worthwhile tool on your work-bench. The most exacting blow-torch users are considered in the manufacture of Clayton & Lamberts. Lasting materials—the strongest available, selected for long, efficient use. Many of the features of design are exclusive and patented Clayton & Lambert improvements—the result of 40 years experiment and invention. And Clayton & Lambert torches are made by precision workmen. Men who think of tools and look at tools in the same light as you.

For instance—the vaporizing chamber has an exclusive vein system for quicker, hotter heat. That makes the torch function better and even money on your fuel bills. All fittings are built into the tank by a patented method that prevents their falling in or coming out. There's *absolutely no danger* of an explosion with a Clayton & Lambert torch. Even the most delicate part—the gas orifice—is foolproof. In the No. 158 the orifice has a guard. The slightly higher priced No. 32 has a patented design so that you'll never ruin the torch by a careless twist of your wrist. And when you close the valve you automatically clean out the orifice.

Things of that sort have made Clayton & Lamberts the largest selling torches in the world. There's satisfaction and pleasure in working with such a fine, capable tool.

You can buy Clayton & Lambert torches at hardware, electrical and automobile accessory stores. Look for the handle—it's red with a gold stripe. But to be sure—look for the trade-mark too. It pays you to be certain that you're getting a Clayton & Lambert.

CLAYTON & LAMBERT
MANUFACTURING COMPANY
Detroit, Michigan

BOYCE MOTOMETER

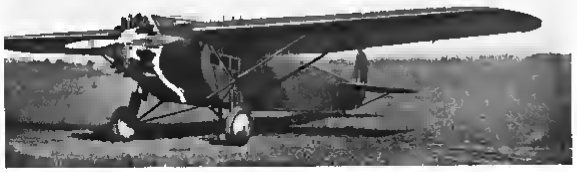
The MotoMeter Company and its subsidiary, the National Gauge & Equipment Company, offer a complete line of airplane heat indicators, oil pressure and air pressure gauges.

Long experience in the manufacture of these instruments, coupled with large production, makes it possible to offer high grade instruments at reasonable prices. Every means has been taken to insure the dependability of these instruments.

Heat Indicators
Pressure Gauges

The MotoMeter Company, Inc.
2 Wilbur Avenue, Long Island City, N. Y.
The MotoMeter Company of Canada, Ltd., Hamilton, Ontario
National Gauge & Equipment Company, La Crosse, Wisconsin

ONE FOKKER MONOPLANE



Fokker super Universal Cabin type, dual control, 410 HP Pratt & Whitney "Wasp" motor.

—at an exceptionally low price

Priced for a quick sale, this Fokker Monoplane is positively the biggest "buy" of the month. Mechanically perfect, with comparatively few hours in the air (having been used for business purposes only), here is a plane which will give you the maximum amount of service. Just drop a line to Box SC, care of this magazine for a demonstration.

"How To Use Aviation Insurance Protection Economically and Advantageously"

Insurance Protection Available

aggregates over $1 000 000 per aircraft

Constructive total loss
Accidental Damage
Fire Tornado Theft
Cargo (direct and liability)
Damage to ground property
Airport and Airmeet liability
Life insurance
Public liability
Property Damage
Passenger liability
Personal Accident
Compensation
and
other forms constructed as required

An Open Market to all Insurance Companies, Reinsurers, Agents and Brokers Standard conditions amended to meet special requirements

. . . . . Is the title of our new brochure. Ask us for a copy. It explains also our free advisory service founded on 20 consecutive years' practical experience in aviation and supported by our corps of highly qualified aeronautical engineers and our staff of executives, each one of broad practical experience in flying besides long training in insurance.

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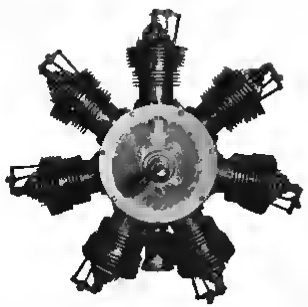

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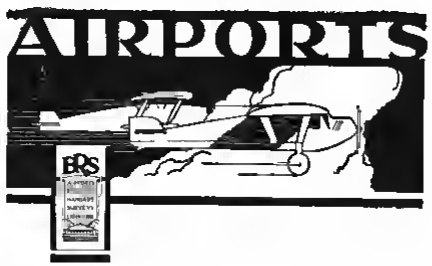

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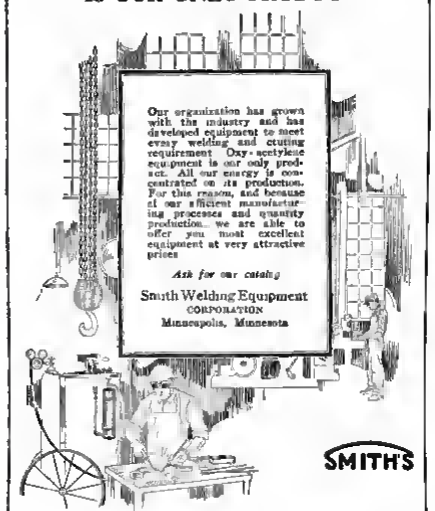

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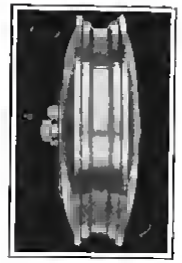

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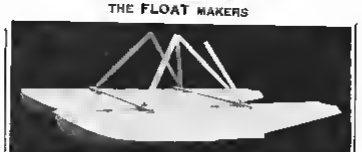

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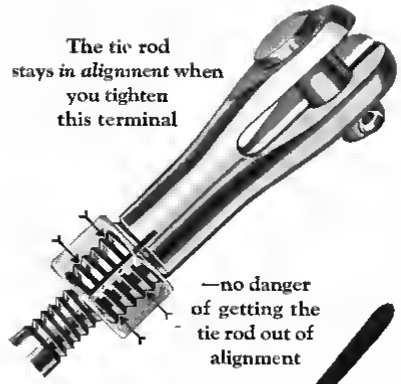

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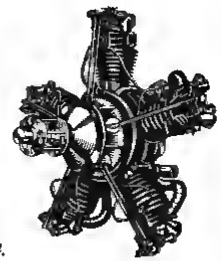

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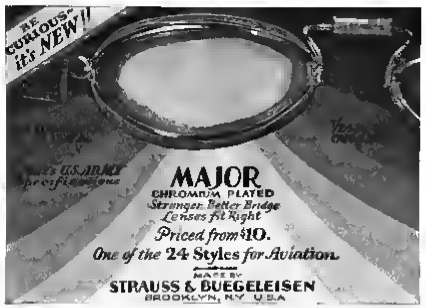

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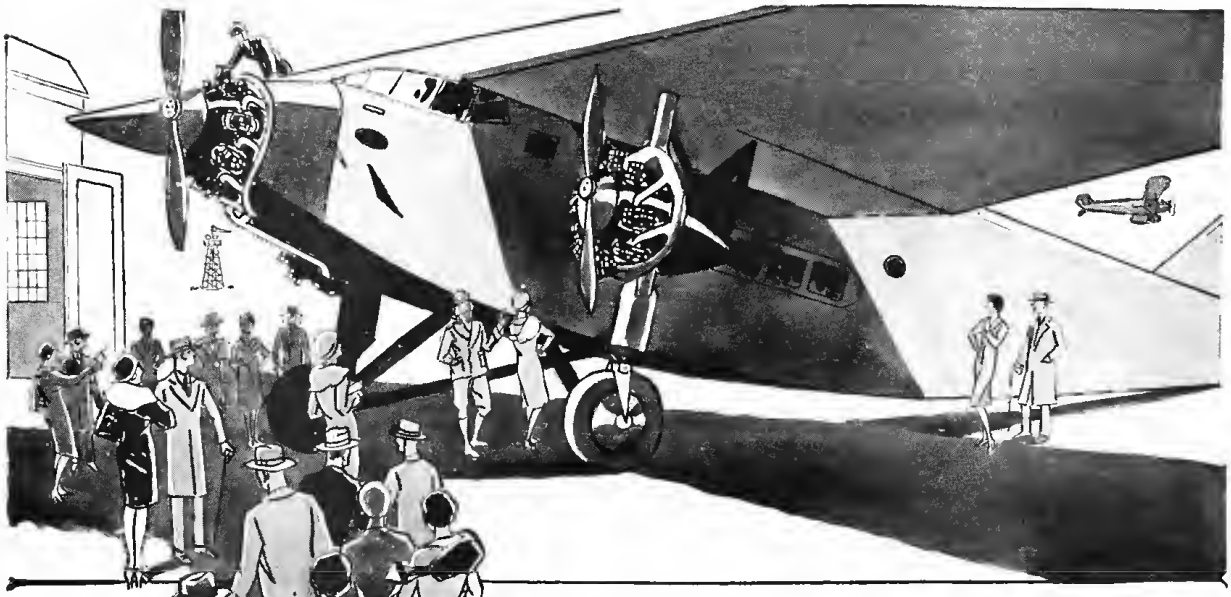

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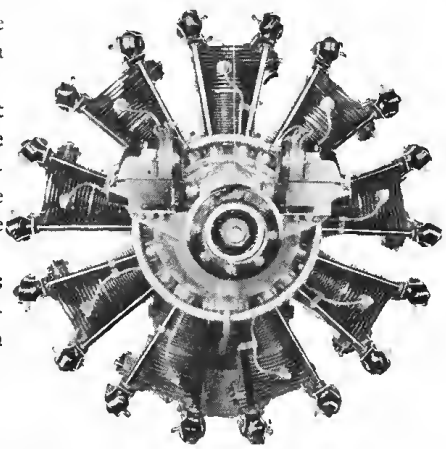

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